

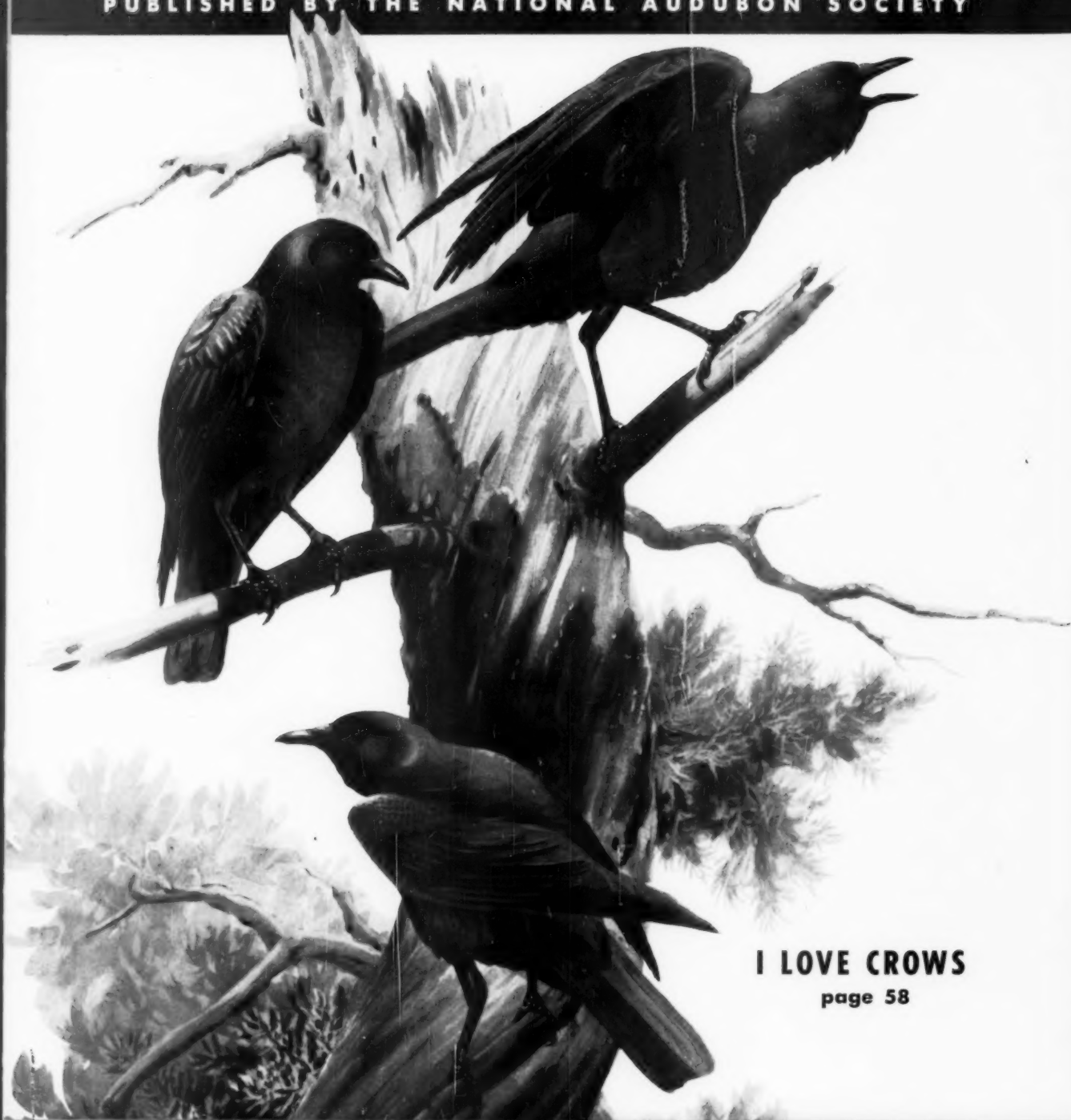
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MARCH-APRIL 1959

Magazine

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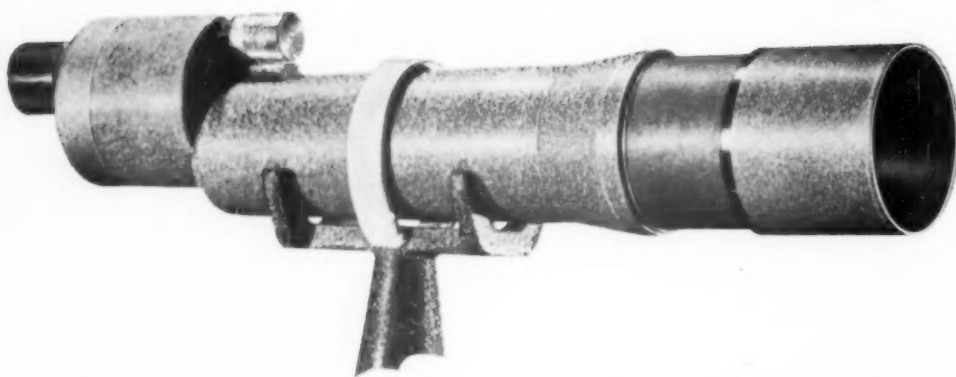
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I LOVE CROWS

page 58

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Audubon magazine

Volume 61, Number 2, Formerly BIRD-LORE

PUBLISHED BY THE NATIONAL AUDUBON SOCIETY

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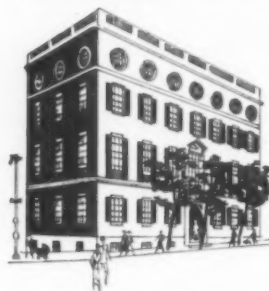
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Letters

Impressed With Insecticides Article

After some years' interruption of my subscription to *Audubon Magazine* (I knew it best as *Bird-Lore!*), I am greatly impressed with the contents of the January-February 1959 issue. The article, "Insecticides and Birds," about the horrifying effects of DDT spraying, is particularly impressive and gives scientific support for ideas I have had for many years.

My wife and I would be particularly gratified to see this article taken by *Reader's Digest* for condensation—the effect might be enormous and it certainly is needed.

GEORGE BELL DYER

New Hope, Pennsylvania

Reprinting "Insecticides and Birds"

I have just been reading a copy of Dr. George J. Wallace's paper on "Insecticides and Birds" given at the annual convention of the National Audubon Society on November 10, 1958. I also have a letter from Dr. Wallace, stating that this paper has just been published in the recent issue of *Audubon Magazine*.

As a part of the campaign of the Wisconsin Society for Ornithology to alert the public to the grave dangers involved in the increasing use of insecticides, we should like to reprint Dr. Wallace's article in *The Passenger Pigeon*. He has given his permission, but I realize that your permission is also necessary. Are you willing that we should reprint this article?

You are doing a splendid job of keeping key conservation issues before the public. Keep up the fine work!

REV. SAMUEL D. ROBBINS, Editor
The Passenger Pigeon
Adams, Wisconsin

COMMENT

We were pleased to give Dr. Robbins permission to reprint "Insecticides and Birds." We have published his letter to show that Dr. Robbins and the Wisconsin Society for Ornithology are doing an alert and splendid job for conservation in their state.—The Editor.

Birds of West Texas

I am afraid your readers were left with a mistaken idea of the birdlife of west Texas by Mrs. Wilkinson's statement in your January-February 1959 is-

sue, page 2, that "songbirds are practically non-existent" in this area. The Midland Naturalists, just 100 miles south of Lubbock, have recorded 250 species of birds within 50 miles of Midland. There are 60 species of breeding birds, there were 78 species on the last Christmas Count, and we have recorded 98 species in a single day during spring migration. While this cannot compare with some eastern areas, we feel it is very good for a near-desert with an average rainfall of less than 15 inches.

MRS. HAROLD L. WILLIAMS

Recorder, Midland Naturalists
Midland, Texas

More About Intoxicated Robins

With reference to Dr. A. J. Phillips' letter, published in your January-February 1959 issue, page 6, I, too, have an observation of intoxicated robins to report.

January, 1958, was unusually cold in Florida as well as up north and suddenly hundreds of robins appeared in our garden and stayed for about a week or ten days. They acted "lost" and after eating many palmetto seeds, drank great quantities of water. The birdbath was filled three times one day and so anxious were the robins to drink that sometimes they would stand on each other's backs. Then they became intoxicated and behaved in a very bewildered manner. We felt their strange behavior was due to being forced from their natural winter home as we do not usually see robins until early spring and then only a few, not in such flocks.

I would also like to ask if others have remarked on the fact that the male red-winged blackbirds seem to winter inland; the females along the coast.

MRS. JOHN D. ROWLAND

Pompano Beach, Florida

Robins Choking on Chinaberries

In the January-February 1959 issue of *Audubon Magazine*, you published a letter from A. J. Phillips of Toronto, Ontario, Canada. He described the peculiar behavior of robins after eating the berries of a mountain ash tree.

In your comment, you mentioned records of "intoxication" of robins after eating the fruit of Chinaberry trees. The following story was told to me and was not a personal experience:

In Summerville, South Carolina, a number of years ago, some person became interested as to why only certain robins of all that fed on Chinaberries became "intoxicated." On picking up one of the robins, it was found that contrary to being "intoxicated" the bird was choking because the berry was too large to swallow.

Could that be the same cause of the

peculiar behavior of the robins reported? Some kinds of mountain ash trees produce very large berries.

ELIZABETH HUNTINGTON

Pleasantville, New York

Enjoys Our Letters from Readers

Audubon Magazine came to me as a gift in 1957, and I have enjoyed it very much—have been missing something good all these years.

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A Rookery Near Miami

During the winter many members of the National Audubon Society come to Florida, and are interested in any place where the birding is good. I feel that many of your readers would like to know about the Greynolds Park rookery, which is located in a county park just off U. S. Route 1 about 15 miles north of downtown Miami. The unusual feature of this rookery is its accessibility. Persons who because of physical limitations, or because of a rushed schedule, cannot visit the rookeries of Everglades National Park, will find most of the wading birds there. A nest count of waders there this season was about 385, with cattle egrets predominant, then white ibises, little blue herons, Louisiana herons, green herons, and snowy egrets. American egrets are present but did not nest this season. Ward's great blue herons are usually present but not for nesting. Others that one may expect here are the pied-billed grebe, coot, Florida gallinule, anhinga, and cormorant, and during the winter, the smooth-billed ani. Occasional visitors include the great white heron and roseate spoonbill, the latter being rare. Glossy ibises are also irregular.

Since there is no nesting during the winter, visitors should plan to view the rookery just as day breaks, or toward evening, when the birds flock in from their feeding grounds. It is actually possible to sit in a car and see a great deal, so even semi-invalids can enjoy unusual birding.

Unfortunately, most of the waders, except the cattle egret, depend to a great extent on a tract of land where development is planned for civic use. The rookery seems secure for at least the next two seasons, but if no way is found to protect their main source of food, it is possible many of these lovely birds will forsake this spot for locations that are nearer a food supply, but so removed that they cannot be so easily viewed by the public.

CARTER BUNDY

North Miami Beach, Florida

Thanks from Mrs. Lee

I just can't seem to find the words to tell you about the wonderful things that have happened to us as a result of having my letter appear in your September-October 1958 issue of *Audubon Magazine*.

We have had mail from people in six states and Japan and so many of them sent gifts. To date our son Jimmy has received subscriptions to two magazines, a bird feeder, a bluebird nesting box, two books, two pairs of binoculars (one of which he has given to a friend who is also interested in birds), and a membership in the Junior Audubon Society (which inspired him to start a

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bird club among the children in the neighborhood). I have written to all the others and I am corresponding regularly with a lovely lady in California and another in Japan. In fact, I have been kept very busy writing to all of the kind people.

Jimmy says with so many people encouraging him he will just have to make good as an ornithologist now. He decided a year ago to be one and, unlike many boys whose plans and ambitions change with the weather he is standing firm. It must truly be a gift from God because until Jimmy showed this great interest in birds, neither his father nor I had been very much interested in them.

This has been a very heart-warming experience for all of us and we feel very humble, and grateful.

MRS. WILLIAM LEE

George's Trailer Park
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Camp Hill, Pennsylvania

A Bird in the Hand

I am enclosing a picture of my son, Bruce, with a black-capped chickadee taking sunflower seeds from his hand.



My husband, Glenn Noe, took the photograph. I wish Bruce, with his scientific and loving interest in nature, would consider it as a career.

MRS. GLENN NOE

Ada, Ohio

Lewis' Woodpecker

In reply to Mr. Schneider's request (p. 149 of the July-August 1958 issue of *Audubon Magazine*) for observations of Lewis' woodpecker, we are glad to report on our field observations as follows:

Our first encounter with this species was on July 31, 1951, near Rigby, Idaho. We observed the parents and a family of five or six full-grown young flying along our route and alighting on trees and fence posts along the roadway.

Our next encounter with this species

was in the Black Hills in South Dakota. In a large burned-over area near Mystic, not far from Hill City, there is quite a large concentration of these birds. We have observed them in the area each year since 1952. Our visits to the area are usually in July.

On a visit to the Boy Scout Philmont Ranch, near Cimarron, New Mexico, during August 1957, we observed a heavy concentration of these woodpeckers on this 130,000-acre ranch. We would not be surprised if the number of birds in the ranch area ran as high as 100.

We have done field work in all 48 states, and these are the only three locations where we have observed this species.

WHITNEY AND KAREN EASTMAN
Minneapolis, Minnesota

Knowledge Is Not Wisdom

On Page 237 of the September-October 1958 issue of *Audubon Magazine*, I noticed the following comment in the article "Falcon in the Sky."

"There is danger that we shall become increasingly more shrewd and increasingly less wise."

There occurs to me a statement that I read one time in a magazine at least 25 or 30 years ago, as follows:

"During the last two or three thousand years, knowledge has increased tremendously but wisdom—not a bit."

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CONSERVATION Briefs

Conservationists Win Porcupine Mountains Battle

"Conservationists won an all-out victory in their clash with mining interests over Michigan's Porcupine Mountains State Park, according to the Wildlife Management Institute. The Bear Creek Mining Company has withdrawn its application to lease 933 acres of the park for copper mining. The Michigan Conservation Commission was to have announced its final decision early this month.

"The company sought permission to extract copper from the 58,000-acre park, described as the last remaining wilderness area in the Middle West, and from adjacent lands under Lake Superior. The application created a storm of protest from outdoor groups in Michigan and across the nation. The numerous public hearings that were held revealed widespread opposition to granting the lease. Gerald E. Eddy, director of the Conservation Department recently recommended that the lease be denied."—*Outdoor News Bulletin*, Wildlife Management Institute, January 16, 1959.

Montana Halts Crow, Magpie Bounties

"Helena, Mont. — Following wide recognition that bounties do not control wildlife populations, the Montana State Fish and Game Commission has rescinded an order making matching funds available to sportsmen's organizations for payment of bounties on crows and magpies."—*Conservation News*, National Wildlife Federation, January 1, 1959.

Nene Goose Nests Found

"The special program authorized last year to save the rare Hawaiian Nene goose is moving ahead, the Wildlife Management Institute reports. A biologist for the Board of Commissioners of Agriculture and Forestry has located seven Nene goose nests in the wild. Only one active nest had been found during all past years of observation.

"Some nests are in rough lava beds,

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Quotes: "We loved every moment . . . our lives have been so enriched . . . the friendships among the campers, the sharing of mutual interests was a happy experience and the Staff, well, they are the best teachers and friends one could ever have." Mr. and Mrs. J. Lewis Scott, Pittsburgh, Pa.—Conn. '58

"The Audubon training has given our program a tremendous momentum. You have waved a magic wand. Thousands of children will have new doors to new worlds." Larry Mickolic, Program Director, Herald Tribune Fresh Air Fund, Conn. Camp, '58

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- ☐ June 28-July 4 All Scout and Campfire Leaders
- ☐ July 5-July 18 Regular two-week session
- ☐ July 26-Aug. 8 " " " "
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Quote: "... one of the highlights in my life as a 4-H leader . . . it has value unlimited to any leader . . . I cannot say enough . . . it has given me a better understanding of basic nature . . . how soil, water, plants, and our wild creatures depend upon each other." Mrs. William Zehm, 4-H Leader, Wisc. '58.

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hundreds of yards distant from cover. The nest study is one phase of the overall Nene restoration program. Much of the success of the program depends on what can be learned about the non-migratory birds, their habits, and their needs.

"Credit for swift authorization of the restoration program by Congress last year goes to Senator Warren G. Magnuson of Washington, Congressmen Herbert C. Bonner of North Carolina, and Delegate John A. Burns of Hawaii. — *Outdoor News Bulletin*, Wildlife Management Institute, January 16, 1959.

National Wildlife Week

The 1959 observance of National Wildlife Week is scheduled for March 15-21 and will feature a "Conservation in the Schools" theme. National Wildlife Week has been sponsored annually since 1938 by the National Wildlife Federation.

Walt Disney, widely-known producer of the "True Life Adventure" nature films, again is serving as national honorary chairman of the observance.

The Wildlife Week kits being distributed to state chairmen contain a basic educational leaflet, "The Three R's and Resources," by Dr. Wilhelmina Hill, of the U. S. Department of Health, Education, and Welfare, and a conservation sermon, "While Men Slept," by U. S. Senate Chaplain Frederick Brown Harris. Other materials in the kit are: news story materials and photographs, spot announcements for radio and television stations, proclamations for governors and mayors, a leader's guide, speech materials, window posters, the "Conservation Clubs for Juniors" leaflets, and a set of wildlife stamps.

Although the official opening on the "Conservation in the Schools" educational campaign is scheduled during National Wildlife Week, the program will be continued throughout 1959.

Organizations and individuals wishing to participate in the National Wildlife Week observance are invited to contact their state chairmen.

State Garden Club Offers New Audubon Camp Scholarship Award

The Garden Club of Ohio, Inc., through its State Awards Chairman, Mrs. James Fisher, is now offering

Turn to next page

NATURE STUDY

Spend an interesting vacation at beautiful Elk Lake in the heart of the Adirondacks. Learn about the native plants, birds, and other wildlife under the leadership of an experienced naturalist and teacher.

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THE KATHLEEN HOSTETTLER AUDUBON SCHOLARSHIP AWARD

This may be won by that Garden Club in Ohio which presents the most interesting report on its experiences with plans and ideas toward stimulating interest in sending a teacher to an Audubon Camp.

The idea for this award, (which will be a two-week scholarship to an Audubon Camp for a teacher) is the result of the rewarding experiences Mrs. Merle Hostetler of Brecksville, Ohio enjoyed at the Audubon Camp of Maine and the Audubon Camp of Wisconsin.

New Hawk and Owl Protection Laws in Massachusetts and New Jersey

Two more states now protect all birds of prey. In October 1958, Massachusetts became the twelfth state to give protection to the Cooper's hawk, goshawk, sharp-shinned hawk, and great horned owl. On January 12, 1959 the State of New Jersey became the thirteenth state through a similar law in the signing of Senate Bill No. 71 by Governor Meyner. Under both the Massachu-

setts and New Jersey laws, hawks and owls are fully protected, with the provision, however, that birds seen destroying poultry may be killed. Passage of the New Jersey law means that the notorious slaughter of hawks at Cape May, and along the northern ridges of that state, will cease. Credit for the success of the laws in both states should go to many individuals and cooperating groups of conservationists, sportsmen, and farmers. Hawks progressing south along the Atlantic flyway now have full legal protection in Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Virginia, and Florida. During the fall migration, hawks are also protected along ridges of Pennsylvania, where they have been slaughtered in the past in such vast numbers by hunters.

BRAEBROOKE in the Berkshires, Lenox, Massachusetts

House clothed in majestic dignity. Veranda looks out upon a sea of mountains beyond mountains. About 1½ miles from famous Pleasant Valley Bird Sanctuary. Three different nature trails make birding and strolling an added delight. Tanglewood within 1½ miles on back road. American plan. Very modest rates. Special consideration to groups. Write or phone - Box 332, Lenox, Tel. Lenox 960 . . . or 35 Orchard Place, New Rochelle, N. Y. Tel. NE 2-5117 . . . or in N. Y. City tel. BUtterfield 8-7759.

Flight for Projection



This is one of ten photographs of birds in flight, just added to the Society's library of slides for projection. The ten, offered in a set at \$10, include the Kingfisher shown here, plus the Bluebird, Red-wing Blackbird, Red-bellied Woodpecker, Yellow-shafted Flicker, Great Horned Owl, Ruby-throated Hummingbird, Barn Swallow, Golden-crowned Kinglet, and White-throated Sparrow.

PHOTO AND FILM DEPARTMENT
National Audubon Society, 1130 Fifth Avenue, N. Y. 28, N. Y.

GOD BLESS AMERICA

By Weldon F. Heald*

"I LOVE thy rocks and rills, thy woods and templed hills." So runs one of our most popular national songs.

I have seen Americans stand and sing "*My Country 'Tis of Thee*" with tears of emotion in their eyes and selfless exaltation in their bearing.

But I just don't believe it.

The more I see of our blasted rocks, dammed rills, cut and burned woods, and bulldozed hills the more convinced I am that the average American has no consideration for them whatsoever. Or if he does, he seems apathetically unmoved by the destruction around him.

We love wealth, prosperity, and growth. We take pride in a high standard of living. We thrill to automatic gadgets, deep freezes, and jet planes. We boast of a mechanical, electrical, atomic civilization wrapped up in a package labeled, "Liberty, Democracy, and the Pursuit of Happiness — Handle with Care." There may be a super-streamlined Frankenstein inside. But God bless America. We love it.

However, there is another America. It is under our feet. It is around us. It is the land we live on — the forests, hills, valleys, mountains, and deserts we took from the Indians.

Do we love this America, too? Well, maybe. But it looks to me as if we were so dissatisfied with its general appearance and arrangement that we are trying to change everything about it in the shortest possible time.

For, all over the country powerful interests, representing themselves as the majority, are closing in, bent on despoiling and obliterating every last vestige of original

America. Although national parks preserve less than one per cent of our land in primeval condition, giant dams are proposed for four of them, and lumbermen demand the finest forests in a fifth. National forests provide less than one per cent of the nation's cattle-feed requirements, yet embattled stockmen are asking for the forests as their private preserve. Miners and sheepmen want the national monuments. State parks are succumbing to commercial interests. Marshes are drained, lakes emptied, and predators exterminated so that wildlife suffers from unbalance. Each year thousands of acres of timber are indiscriminately hacked and burned, the range is depleted, soil exhausted, erosion accelerated, streams polluted, air contaminated.

Truly, this is a love that passeth understanding!

Years ago Americans who valued this original America became alarmed at the rapidity with which it was disappearing. They started a movement for the preservation of natural resources, both economic and scenic, which has ever since been known as CONSERVATION. From it has grown the national parks, national forests, national monuments, the state parks, and all other attempts to preserve some of our national heritage for the use and enjoyment of Americans who love, value, and appreciate the land they live on. Today, there are thousands enlisted in the battle to preserve the resources and character of our country. But they are still woefully in the minority.

The front-line minutemen of the revolution fought at Lexington and Concord for the America they loved. Those historic patriots won against great odds. It can be done again. But don't wait for orders. Start firing NOW! Join the present-day Minutemen by thinking, talking, reading, and spreading the importance of CONSERVATION.

God bless America — and let's save some of it.

* Reprinted with the author's permission, from "*The Living Wilderness*," Spring 1951 issue, published by The Wilderness Society, 1840 Mintwood Place, N.W., Washington 9, D. C.



I LOVE CROWS

Illustration by the author.

By E. J. Sawyer*

SOME people might laugh at my choice, but I love "the blackest of them all," the crow. And especially the common crow of our Northeast, the most mischievous, the most widely and profoundly disliked, and the most relentlessly persecuted of his far-flung kind. In what follows you may find more or less of an explanation for my attachment to the bird anything but an apology, which I flatly disavow.

This was almost the first wild bird

of my acquaintance. On the cold northern edge of New York State where my childhood was passed the crow was the true, though not generally credited, herald of spring. My memory makes those first returning high-flying crows seem as vivid now, after more than 70 years, as they were in reality.

It was an annual "red-letter day" when, on some March morning before I was out of bed, I heard the well-known "caw, caw, caw-aw," and knew that the crows had returned. Hurrying downstairs and quickly opening our front door, I took a cautious view of the top of a tall, lone pine tree standing beside our front gate. There I could see one or two

* Many of our readers will remember Mr. Sawyer's article, "Woodpeckers—Carpenters for Other Birds," published in our March-April 1958 issue. Now almost 80 years old, this well-known artist-naturalist makes his home in Burton, Washington.—The Editor

of the early comers, on the very tip-top of this tree, the tallest in our village.

How those first crows did thrill me! They were, to me, beautiful, and if "Music hath charms," they were musical to a high degree. When near enough, their attitudes and gestures and the flashing gloss of their plumage united to excite my admiration in some strange way. Their voices, close and raucous or distant and clear-cut, had all the effect of a bugle call to my wanderlust.

To me what a change that first crow made in the looks of the world! The event meant the near-end of winter with its snow-shoveling, chapped hands, frostbite, chillblains, kerosene-soaked neck bands, camphor-saturated sugar, and red flannel underwear. It had a still more immediate meaning, an electrifying effect: if school could only somehow be endured until the next Saturday it might not be too early to explore some maple sugar bush for a drink of the first run of sap; or even to tap the several maples that bordered our own sidewalk. Anyway, the first robin and bluebird would come next — and soon. Then it would be a comparatively short step to summer.

Everyone I knew at that time hated crows and in our community he was Enemy No. 1 of the farmer, to be treated accordingly. Any and every means of wiping his kind from the face of the earth was regarded as fair and commendable. Such a thing as to declare my own private and wholly unshared fondness for the bird was as utterly unthinkable to me as it would be to confess my secret devotion to a certain brown-eyed, pig-tailed member of my class in the First Grade.

I never heard or read a single favorable or even tolerant word for the crow until, in my early teens, I read Longfellow's, "*The Birds of Killingworth*," in his "*Tales of a Wayside Inn*." The lines leaped at me, engraved themselves on my memory and, from time to time ever since, I have found myself mumbling in my nostalgia,

"Even the blackest of them all, the crow,
Renders good service as your man-at-arms,
Crushing the beetle in his coat of mail,

And crying havoc on the slug and snail."

Not that I belong to the school of thought which divides the birds into two main groups — the good and the bad; by which is meant, respectively, birds economically useful (therefore to be loved and encouraged) and birds regarded as more or less of a handicap to man in his efforts to monopolize nature's bounty (therefore to be "controlled," the gracious synonym for "killed"). Nothing could be farther from my own feeling for the crow than to seek an economic or other practical reason for his existence. He was not the result of absent-mindedness on the part of the Creator, but, of course, the farmers, in one voice, would remind me that I had no sprouting corn to be pulled up. True, but if I had, the crows would have been welcome to their share.

All arguments aside, and granting that from a peculiarly human point of view the crow is not without faults, why may we not hate the transgressor, if we must, but love the transgressor? — thus practicing what we so piously preach. In fact, we do exactly that in the case of that dedicated and expert eater of our cherries and strawberries — the dearly beloved robin. It seems that taking ways of quite another kind, plus a colorful dress and pleasing voice, make a world of difference. In strictly human affairs such things have also been known to sway juries.

My brothers and I occasionally took a young crow from the nest, caged and hand-fed it to be a pet. No young bird that I know of can so easily be reared from so tender an age. Unfortunately, none is more clamorously persistent on being fed at inconveniently short intervals. Also a young crow takes its food with gargling sounds that accompany each morsel, and suggest a starveling being force-fed. Yet somehow we were always rather amused by those overplayed, eager, guttural chokings. Still, a crow, young or old, is scarcely to be recommended as a house pet to persons of a sensitive musical ear. The bird's best efforts at song demand, for its most pleasing effect, nothing less than the great outdoors. The crow's best friends must grant that his voice, heard too closely and repeatedly, is not altogether pleasing

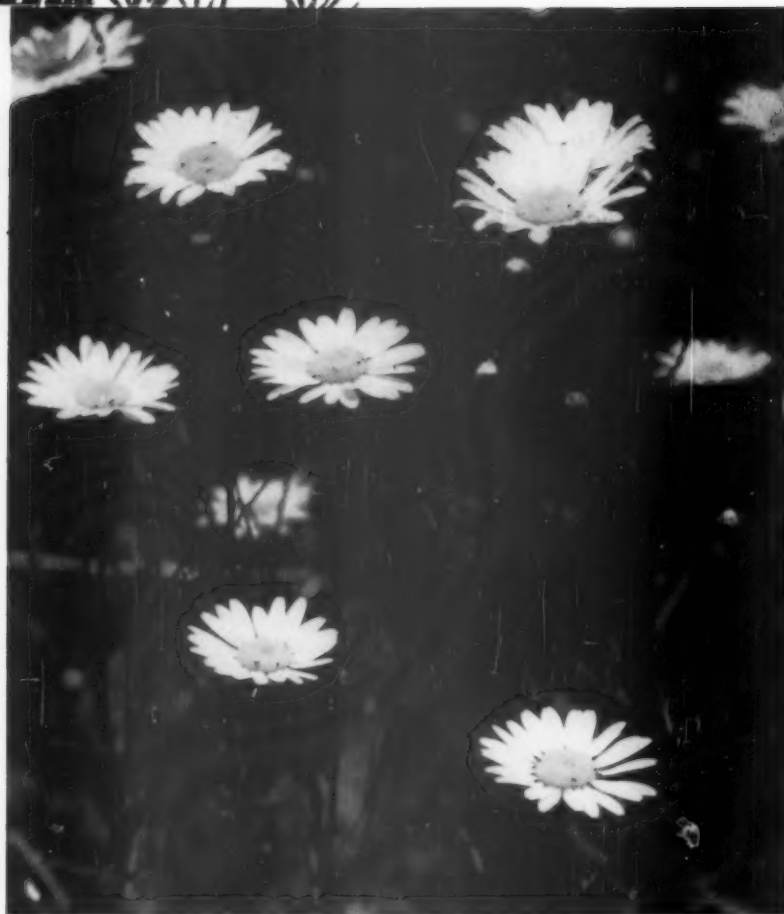
and can even become unbearably monotonous.

Many of our birds — too many by far — have been either locally exterminated or drastically reduced in number through persecution due to a conflict of interests; which is to say, through our wilful nullifying of the rule, "live and let live." To cite only one example, passenger pigeons — at a time within the memory of persons still living — were competently calculated to number over three billion individuals. Chiefly through human persecution, the passenger pigeon has long been extinct. The crow, a species never nearly as abundant as the pigeon was, and the object of sheer hate (from which the passenger pigeon was exempt), has survived and prospered in the face of the worst man could do and has done. Shotguns, traps, organized crow-shooting campaigns, poisoned grain, scarecrows, and who knows what other devices have done little else than add to the cunning of this naturally resourceful and adaptable bird. Of all birds he is the least deceived by the farmer's usual dummy. From a judicious distance he studies it a while, notes that from day to day it remains in the same spot, that unlike the laziest farmhand of his acquaintance its back never bends, its arms never move. So the crow is not long in recognizing that what the farmer deemed a reasonable facsimile of himself, or one of his help, is a ridiculous man of straw or at worst a ragged tramp, and hence of all mankind, the least to be feared.

To say the crow is a robber of other birds' nests is one way of saying he is, like every other creature, a factor in maintaining the admirable balance of nature, and to some of us the world will always be pretty much of a great Sherwood Forest in which the crow is another Robin Hood. We will continue to wish him an increase in cunning for his self-preservation to match and overmatch every present and future device contrived to obliterate his kind. Certainly he has triumphed in his battle for existence against incredible odds.

Do birds have souls? If so, here is one wholly worthy of Addison's tribute:

"The soul . . . smiles at the drawn dagger
And defies its point." — THE END



Photograph of daisies by William J. Jahoda.

What the school and the children lost,
might have been saved. This story is

A Case for Natural Areas

By Fleur Grandjouan*

ONCE there was a meadow, a wood, and two ponds. They were not large—the area that they occupied was not more than a couple of acres. On one side was the railroad track, and this is how I came to know this place, for day after day I saw it from the train window. One day I followed the tracks until I came to the meadow when the late afternoon sun was shining in the long grasses and the daisies in bloom. On the other sides were a housing development, a municipal reservoir, and a road—or so it was when I found it.

*The author went to the Audubon Camp of Maine, as a camper, in 1955 and has been a staff assistant there for the last three years. This is Miss Grandjouan's first article for *Audubon Magazine*, and reflects the training in ecology that she got at the Audubon Camp of Maine.—The Editor

This land was not in its primeval stage. The wood was a small, scrubby grove of second-growth trees and shrubs, though some fine tree specimens by local standards still grew there, and a few lay prostrate over the woodland pond. The pools of water, often growing dry in the summer drought, did not have a long glacial history, and they were hardly big enough to wade in. And the meadow was a direct product of man's occupation of the land—it was born when he cleared the land for agriculture, and its component plants were nearly all introduced by him. The grasses, the roses, the daisies that were a part of the meadow did not belong to the original plant community.

And yet this meager piece of land occupied a significant position; it stood at the threshold of the advancing wave of civilization, as the population of New York, the largest city on the earth, overflowed from crowded Manhattan into the suburbs. It stood at the transition zone between the farmland that was going and the cities that were coming, and soon it would be engulfed by the suburbs.

I have said that the land was not wild; that it was not extensive; and yet within it was crowded an incredible richness of life, perhaps because it stood alone of its kind on the ancient ground of the wild things. An old wild black cherry tree stood at the edge of the railroad

tracks, a tree that had grown in width rather than height and that harbored a long history of its struggle with the elements from the day that it first colonized the mounds of raw earth by the railroad. You could read this long story of a struggle in its great gnarled trunk, if only you had eyes to see. Beyond it was a grassy knoll where a large variety of introduced flowers that elsewhere had earned the names of weeds came into their own and bloomed profusely, displaying a loveliness so often overlooked in plants that we consider out of place. On the other side of the knoll was the field pond, a little fragment of blue sky where the yellow flags bloomed.

The other pond, in the heart of the forest grove, looked brown and glassy from the shade of the trees. It supported a teeming population of tadpoles and other water life, and a

great concentration of birds. How the birds found it on their long journeys I do not know, but never have I seen so much variety of wild birds in such a small place. There they came to drink, and sit on the edge to rest and bathe and dust, for within the shadow of man's habitations, they were in a place somehow inviolate.

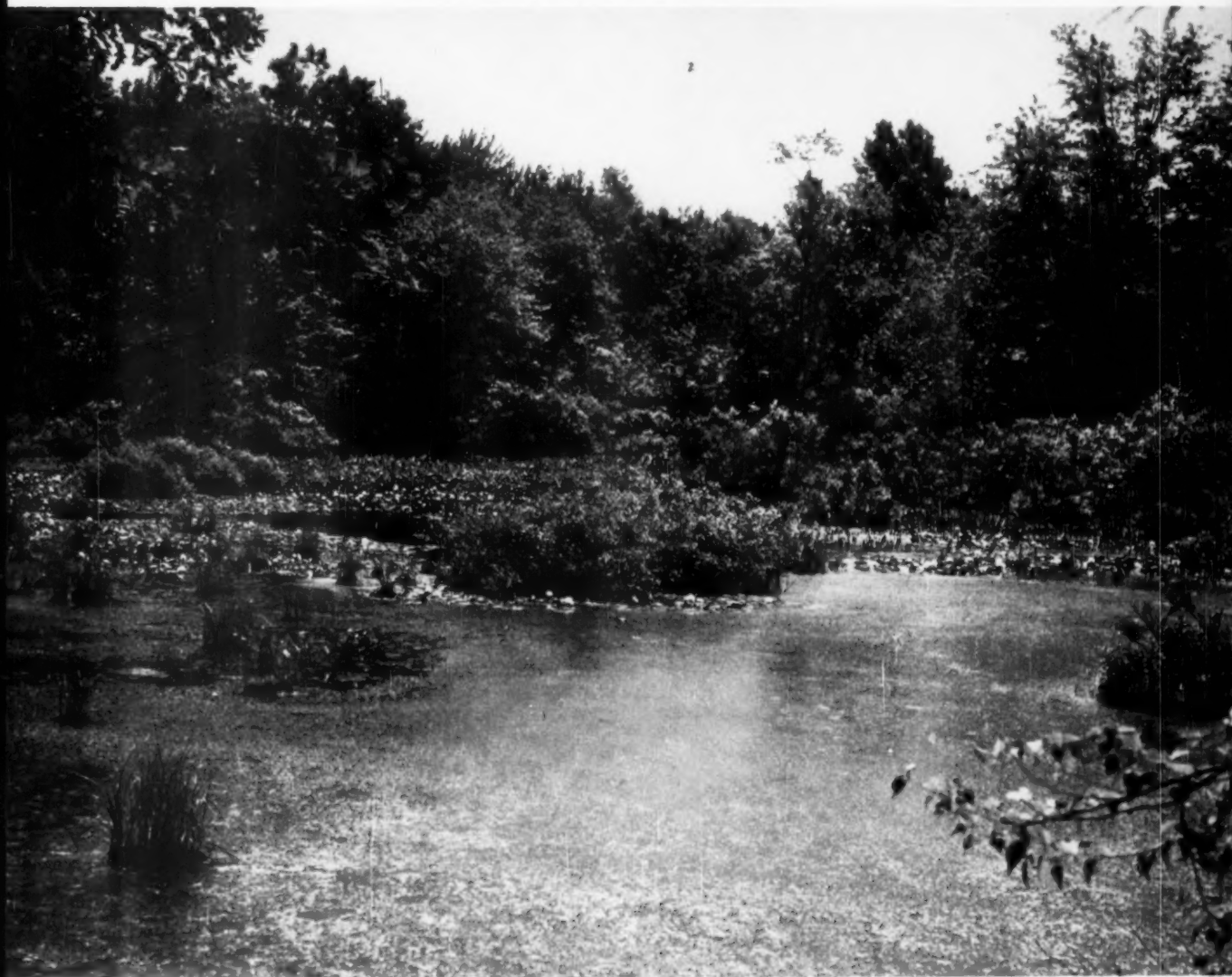
There it was that I first saw the water-thrush, secretive bird of the wet places, teetering its way across one of the fallen trees. And I knew that I could always find it there during the spring, although I might look in vain for it for miles around. If I sat very still by the edge of the pool it would come out, and so would the noisy grackles that "washed" their food in the waters of the pool, and the multitude of other creatures that would go on with their activities oblivious of my presence.

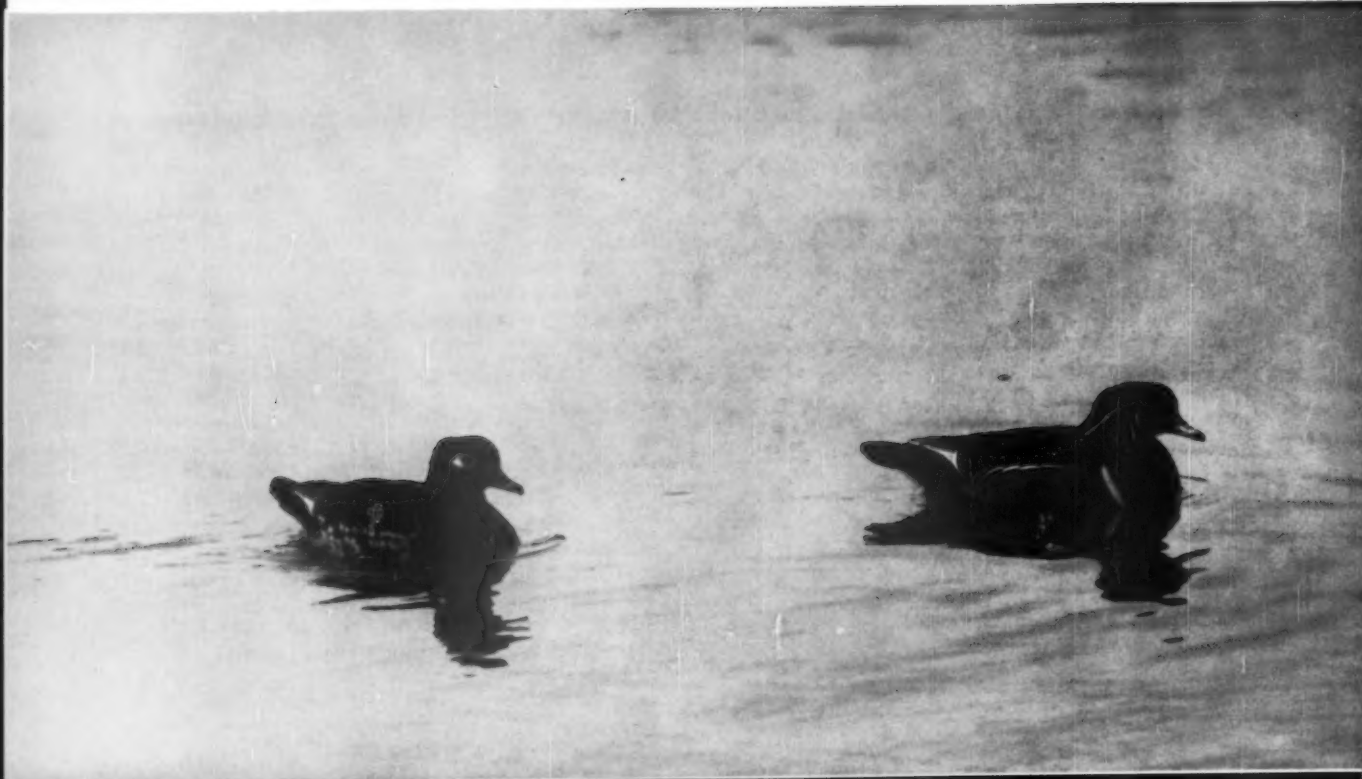
In that grove, with its supply of water, its berry bushes, its dead wood to provide food and homes for the wild things, a tremendous number of creatures found a suitable habitat. And though it was hemmed in from every side by noise and smoke and dust, there was a great calm by the forest pool, a quiet broken by the rustle of leaves, the crackling and squeaking and stir of the wild things going about their business. It seemed almost like a great machine running smoothly, making the little sounds that we know that it should be making as it functions, running as it had run since time immemorial, changing but never breaking down.

And between the two ponds there was the meadow. I will remember always the first time that I came to the meadow, that June day when the daisies were in bloom. The deep rich light of the afternoon sun was

Continued on page 87

Pond and marsh photographed by Hiram L. Parent.





←
Starting in mid-winter, wood ducks form pairs, and the males and females swim side by side. Photograph by Allan D. Cruickshank.

Recoveries of banded birds have revealed some fascinating facts about

The "ROMANCE" of the WOOD DUCK

By Paul A. Stewart*

IN THE mid-nineteenth century Alexander Wilson, the "Father of American Ornithology" and a contemporary of John James Audubon, observed a nesting cavity which was used by wood ducks during four successive years. He thought that the same birds returned to it year after year. With the development of bird banding by the U. S. Biological Survey (now the U. S. Fish and Wildlife Service) in the early decades of the twentieth century, a scientific method of investigating Wilson's hypothesis became available. Bird banding has proved that the female wood duck does return to the same nesting cavity in successive years. In Ohio, a banded female was taken from nests at the same pond in 1955, 1956, and 1957.

Likewise, the young females frequently return and nest near the places where they were hatched. First to return in the spring are the adult females, and they nest at or near their nesting places of earlier years. Next to return are the yearling females. Many of these return to the places where they were hatched, but others spread into the surrounding area and may sometimes nest as much as several hundred miles from their original hatching place.

With the drakes it is different; both first-year drakes and adults seldom return to their original hatching places or their earlier breeding areas. The drake hatched in Minnesota may nest in Maine; the drake hatched in Nova Scotia may nest in

Wisconsin; the drake hatched in Michigan may nest in Georgia; the drake hatched in Louisiana may nest in New York State. The drake which bred in Ohio in a given nesting season may breed in Ohio, Minnesota, Texas, Florida, or New Brunswick during the following nesting season. The drake that bred in California one year, may breed in Nebraska the next. Let us see how this happens.

Although wood ducks from New England winter chiefly in the south Atlantic coastal states, some winter in the Gulf coastal states as far west as Texas. Likewise, wood ducks from Minnesota or Wisconsin may winter chiefly in Louisiana and Mississippi, but some winter at points all of the way from South Carolina and Florida to eastern Texas. When in the South, then, wood ducks that summered in Nova Scotia, Wisconsin, or Louisiana, may occupy the same swamp.

During the early months of the winter, wood ducks move about with indifference as to the sex of their companions. A drake may follow a female, a female may follow a drake, or wood ducks may move about without appearing to follow each other. Pairing has not yet taken place.

Starting in mid-winter, the birds form pairs. A drake and a female swim on the water side by side. The male makes menacing dashes at other males. The drake touches the head of the female with his bill, and both birds stop swimming. The drake gives a series of several up and down jerks of his head, at the same time uttering a high-pitched whistle, and occasionally raising and lowering his crest. The conjugal tie has been made. The female now leads and the drake follows as the pair fly about together. Whether flying to the feeding site, the roosting area, or the loafing place, the female takes the lead and the drake closely follows her.

Soon the migration season arrives. The female, followed by her mate, flies either to the general locality of where she was hatched or to her previous nesting site. Thus, *the origin of the female with which the drake chances to pair determines the breeding place of the drake.* The Indiana-reared drake may pair with a Louisiana female; thus he will remain in the South through the following summer after the young have hatched. The Louisiana-reared drake may pair with an Indiana female; thus he will travel to Indiana to spend his first breeding season. The Vermont female may pair with a two-year old drake from Ohio; thus he may have spent one nesting season in Ohio, but the next in Vermont.

Having arrived at either the birthplace or the earlier nesting site of the female, the drake continues to follow his mate in her daily movements. As she moves about among the tops of the trees exploring possible nesting cavities, she is always closely followed by her mate. The female, however, usually inspects the cavities, and the drake seldom enters but waits nearby while his mate is inside. The drake continues to accompany the female to the nest during egg-laying and the early stages of incubation, but as incubation advances he comes back with her less often. Finally, at hatching time or slightly before, the drake deserts his mate and leaves the care of the young to her. He is free from conjugal ties until he takes another mate in some southern swamp during the following winter.

Meanwhile, the drake joins other wood ducks of the same sex if there are other breeding pairs nearby; together they form flocks of 20 to 30 drakes that have bred in the general area. Soon after the first of June, in the latitude of central Ohio, these small flocks disappear from their breeding areas and enter secluded

* Supported by a research fellowship of the Ohio Cooperative Wildlife Research Unit. Dr. Stewart recently completed three years of research on the wood duck. The results reported in his article are based on 600 wood ducks banded in Ohio, and Dr. Stewart's analysis of 4,000 banded wood ducks reported in the files of the U. S. Fish and Wildlife Service. — The Editor

←
The male follows the female, and returns with her to her birthplace or breeding area. Photograph of male wood duck by John Johnson.

ward beyond 38° latitude N. In the eastern part of the United States most of the ducks migrate farther southward or below 35° latitude N.

After traveling southward as far as Maryland, further movement of New England wood ducks is largely confined to a lane 100-125 miles wide along the Atlantic Coast. This strip corresponds with the locations of the Princess Anne, Pamlico, Talbot, Penholoway, Wicomico, and Sunderland Terraces. The greatest swamps are on the first two of these terraces, but the latter four also contain numerous swamps. At about 32° latitude N. in southern Georgia, there is a westward swing of the Atlantic coastal lane. This westward swing corresponds with the Coharie Terrace. This terrace is characterized by its gravelly substratum, but it also contains some extensive swamps. The Atlantic coastal lane of migrating wood ducks is associated, then, with swampy habitat. It should be noted, however, that the wood duck is confined to fresh water.

While there is a distinct Atlantic coastal migration lane, wood ducks migrating southward from New England are not confined to this lane. A few scattered New England wood ducks winter in Louisiana and Mississippi, and in reaching their winter habitat they travel cross-country over

Kentucky and Tennessee. With birds in the northern midwestern states there is a less distinct migration lane, and wood ducks from Ohio, for instance, migrate in a fan-like vanguard to the area between Dallas, Texas, and Savannah, Georgia. There is only a slight tendency to follow a lane 100-200 miles wide centered over the Mississippi Valley.

Some southward flights may be made rather hurriedly as one wood duck traveled 325 miles from northern Michigan to Illinois in five days. After reaching Virginia, however, some ducks continue a leisurely movement southward during November and December.

Some of the ducks from the New England states do not travel beyond Virginia; some migrate only to North Carolina; some only to South Carolina; and some only to Georgia. Some travel as far as northern Florida. One duck, banded in Vermont, was taken in the Bahama Islands, but most New England wood ducks do not migrate southward beyond 29° latitude N., in northern Florida.

The limit of southward movement of large numbers of New England wood ducks corresponds with the southern limits of the range of several species of oaks. When in the South, wood ducks feed largely on acorns, and it is probable that con-

tinued southward movement is halted in northern Florida by a failure in the supply of preferred acorns.

Most of the wood ducks winter less than 1,300 miles from their summer nesting places, but there is a record of one that traveled 1,600 miles. This bird was banded on August 5, 1954, in Penobscot County, Maine, and it was recovered on December 16, 1954, at Livonia, Louisiana.

Northward migration starts in late February, but most wood ducks reach their northern nesting grounds in March; in the more northern part of their breeding range, in April. The early migrants arrive at their nesting grounds in small groups. The first birds to arrive are the locally breeding birds; northbound transients come later.

Recoveries of banded wood ducks have greatly aided in explaining the migratory behavior of this species. In addition, these recoveries throw some light on the life expectancy of the wood duck. Of 2,458 banded wood ducks which were shot, 69.3 per cent were killed within the first year after banding. After the first year, the mean annual mortality rate was 35.7 per cent. The mean annual mortality rate for all years, exclusive of the last year, was 38.3 per cent. One bird lived to the age of 13-14 years. —THE END

★ ★ ★ NATURE IN THE NEWS ★ ★ ★

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AUDUBON CAMP TEACHES:

Creatures, Plants, Minerals Are Interdependent

By M. R. H.*

For Education is, Making Men;
So it is now, so it was when
Mark Hopkins sat on one end of a log
And James Garfield sat on the other.
—Arthur Guiterman

Those who have paraphrased the above tribute to the renowned president of Williams College by President Garfield to the familiar "the best classroom would be Mark Hopkins on one end of a log and I on the other" will find their ideal in education literally true at the Audubon Nature Camp at the Sugar Bowl, near Donner Lake.

* "M.R.H." is M. R. Henry, Associate Publisher of the Livermore Herald. He says of his experience in 1958 at the Audubon Camp of California: "Mrs. Henry and myself found our two weeks at the Sugar Bowl so valuable and interesting that we already have our reservations for the Audubon Camp of Maine in 1959." —The Editor

Teacher-naturalists many times during our two weeks at the camp actually sat on one end of a log in the forest to explain a point regarding the tree or other nature feature to an intent student sitting on the other.

At all times these leaders taught their groups out among the trees, along river banks or the edges of ponds, in meadows or on masses of granite.

These walking tours were often supplemented by laboratory sessions for more detailed inspection of specimens through the microscope or reference to exhibits or textbooks.

ONE OF FOUR

The California camp is one of four conducted by the National Audubon Society, the others being in Wisconsin, Connecticut, and Maine. Their objective

is to teach conservation of our national resources — wildlife, plants, soil, and water.

Actually the 54 persons who comprised the fifth and final session of the 1958 season were taking, as all similar groups take each year, an elemental course in ecology—"the relationship between living things and their environment, the dependence of living things on one another."

Bird, insect, and rock identification are taught primarily as a means to this end. The student must know the characteristics of each to understand their relationship to each other and to their community as a whole.

ALL PART OF NATURE

They learn that each living thing has its part in the great scheme of nature which makes up the living world and to realize the basis on which is founded this Audubon philosophy—we condemn no wild creature and work to assure that no living species shall be lost.

Continued on page 77



Two males on the defensive. The short-tailed shrew at right is uttering a high-pitched chatter.



Dirt flies as the shrews lunge and feint at each other.



The real fighting is done in clinches such as this one. The shrews can injure each other with their sharp teeth; occasionally one is killed.



Two males break loose from a clinch. One leaps away and leaves the other flat on its back.

All photographs by the author, unless otherwise noted.

Observations of small mammals in captivity disclosed some unknown habits of the

Short-tailed Shrew —

Dweller of the Underground

By John P. Rood*

IT IS safe to say that most people have never seen a shrew. If they have it is usually only a brief glimpse of a mouse-like creature rustling through some dead leaves; yet these little animals are all about us; in the woods, in the fields, even alongside our houses. We do not see them because of their secretive habits and manner of working under cover, but most scientists agree that one species, the short-tailed shrew, is the commonest mammal in eastern North America.

The Ojibway and Cree Indians labeled this shrew *Kin-skee-sha-wah-bee-gah-note-see*, meaning sharp-nosed, short-tailed field mouse. Actually the shrew is not a mouse at all but an insectivore related to the common mole. Its tiny eyes, lack of external ears, and strong front feet adapt the shrew to a burrowing mode of life, and most of it is spent tunneling through the forest or meadow floor in search of earthworms, insects, and small vertebrates. They also eat plant food, and captive shrews will even eat crackers and walnuts. Because of its high rate of metabolism (food-burning) the shrew is a slave to its appetite and must eat a large amount of food to keep alive. However, accounts of its eating two or three times its weight in a day are probably exaggerated. Captive

* While recovering in the fall of 1956 from an illness, the author, a young Michigan naturalist, live-trapped 20 short-tailed shrews, *Blarina brevicauda*, and made many observations on their behavior. He won an honorarium from the American Society of Mammalogists for his work, and presented a scientific paper on it before the 1957 annual meeting of the Society.—The Editor

short-tailed shrews seldom eat more than seven grams of food a day—less than half their weight.

Sleep for the shrew is a matter of an hour here and an hour there, and the little animals do not stay still for long, even while asleep. They wake up every few minutes to change position and to clean themselves before dozing off for another brief nap. They may sleep on their stomachs, on their sides, or even on their backs with all four legs in the air. They usually sleep in one of their elaborate underground tunnels but may occasionally catch a nap above ground.

The short-tailed shrew is an accomplished digger and constructs underground tunnels which serve as shelter and hunting grounds. With rapid motions of the powerful front feet working alternately, the shrew makes a short vertical tunnel. The loosened dirt is kicked to the surface with the hind feet. After digging down several inches the little miner begins a horizontal tunnel. When a load of dirt has accumulated behind it, the shrew turns a somersault and pushes the dirt to the end of the horizontal tunnel with its nose. It continues on up to the surface losing most of the dirt on the way. Undaunted, the shrew again enters the vertical tunnel and kicks the already loosened dirt to the surface with its hind feet. In this manner the shrew is able to dig in hard-packed soil at the rate of an inch a minute. Pebbles and other obstructions are firmly grasped in its teeth and tugged to the surface. From time to time, the shrew smooths out the mound of soil at the tunnel entrance with its nose and front feet.

The short-tailed shrew is commonly thought to vary its insectivorous diet with mice and other small mammals. Actually it is unable to catch mice unless these happen to enter its underground tunnels. On the surface, mice are able to elude a shrew with ease. In a very small cage, where I have kept shrews for observations and experiments, it may be a different story, especially if the shrew is an aggressive individual. The shrew first grabs the mouse in the midsection and the combatants roll about the cage floor in a brief scuffle. The mouse may break loose for a moment but the shrew immediately grabs it by the hindquarters and allows itself to be dragged about the cage as the mouse desperately struggles to break free. The shrew then releases its hold but instantly grabs the mouse by the back and delivers several telling bites on head and body.

It is important to remember that a shrew-mouse battle occurs only in very small cages where the mouse has no room in which to maneuver. In large cages the mouse is always too agile for the shrew and can elude it easily. Shrews show a great deal of individuality in their reactions towards mice and some will not attack a mouse, even in a very small cage. Dr. Oliver Pearson, an expert on shrew behavior, gives the following interesting information on this point:

"I can remember when I was taking movies of shrews killing meadow mice. I wasted yards of film on one *Blarina* that was terrified everytime the mouse came near it; another one made only half-hearted attacks, and a third attacked so fast and so viciously

that I missed most of the action."

Are shrews sociable animals? The bulk of the scientific literature certainly suggests that they are not. Should two pugnacious individuals meet in the course of their daily activities, they face each other with open mouths and give several shrill, penetrating squeaks. One may throw back its head and send forth a loud bird-like chatter of rage. If one does not retreat, the shrews fly at each other and go into a clinch, rolling about the ground and biting each other on head and body. When they break apart they are frequently minus several chunks of fur, and one may be killed if the fighting continues.

On the other hand there is some evidence that shrews are somewhat socially inclined. Mammalogists have often trapped several in the same tunnel, and five shrews, of both sexes, have lived happily together in captivity. They slept, curled together, and frequently nuzzled one another. The sociability of the short-tailed shrew seems to depend primarily upon individual dispositions. Some live peacefully together; others fight on sight. Perhaps age and sex play important roles in the social life of this animal, but this has not yet been determined.

Like many of even our commonest mammals, we really know very little about the life history of the shrew. How well can it see? How many litters of young does it have each year? Why does it die so quickly in live-traps? The answers to these and many other questions are still unknown. There is still much to be learned about this little dweller of the underground. —THE END.

Short-tailed shrew photographed by Leonard Lee Rue, III.





THE LAND SNAILS AROUND US

By Morris K. Jacobson

Part I

IT IS literally true that no matter where one finds himself in America he will never be very far away from some form of land snails. Their

presence may be completely unsuspected, but if one knows where to look and what to look for, land snails can be found in every state in the Union and probably in every county of each state. Whether one is in the lowlands of coastal plains, the high reaches of mountain peaks, the cactus covered wastes of deserts or even in teeming cities, one can always be sure that somewhere not far away, land snails exist and even flourish.

The forests of the eastern United States, especially the mountains of Georgia, Tennessee, Alabama, and the two Carolinas simply swarm with land snails of various sizes, shapes, and habits. It is true that they are not very large nor very showy. The larger ones are up to one-and-one-half an inch in diameter, and about three-quarters of an inch high, whereas the smaller ones are minute points from one-and-a-half to four millimeters in size. Most of them are dull brown or buff in color, a few are pleasingly shiny, but, excepting the Florida tree snails, they have no vivid colors such as one sees in sea shells. It is a pity that these practically omnipresent little creatures are not better known, but there is some satisfaction in noticing that the number of people seriously interested in them is steadily increasing.

The phylum Mollusca, to which the land snails belong, is the second largest of all animals, and is outnumbered only by insects and their relatives. And by far the largest number live in the sea. Like many creatures of the land that ultimately stem from sea-dwelling ancestors, the land snails need constant supplies of moisture to continue to be active, or even to survive. Once I heard a famous zoologist protest that the term "land animals" is a biological misnomer, since all living creatures are actually sea animals that carry the true environment of all life, the salt sea, around with them like ambulating tanks of varying degrees of efficiency. If this is so, then the tank of the land snail is very defective.

If the immediate environment is too dry, they cease their activity and retire into their shells where they live in suspended animation until moisture returns to the air. But they will drown rather quickly in a superabundance of water. For these reasons snails must be looked for in

shady areas that are damp but not wet, such as dank forest dells and glades which have a thick ground cover of rotting leaves. They also live on the well shaded, foliage-covered sides of calcareous or schist cliffs where they cling under the rock overhangs. In cities they live in dank cellars or under moisture conserving debris in empty lots. For some reason they are sparse in pine forests, and seem to prefer good stands of hardwood oaks and maple.

Once a train was held up in the open spaces of Kansas and a snail collecting passenger, to while away the waiting time, reconnoitered the small broken stones on the railroad bed. There he found amazingly large quantities of small mollusks. Since the sun is a moisture absorber, land snails are largely active at night and rarely venture forth when the sun is shining. However, cloudy mornings that follow a rainy night will sometimes lure them forth to feed.

Snails which inhabit desert regions—and, surprisingly, many species are found nowhere else—have developed remarkable powers of hibernation (better *estivation* since it is the searing summer suns they seek to avoid, rather than the killing frosts of winter). They are active only during infrequent desert rains. Otherwise, occasionally for years at a stretch, they hide in the deep crevices of rocky talus slopes. No one has actually taken the trouble to find out just how long these desert snails can go without eating or drinking, but there is a record of a desert snail collected in Egypt in the 1850's. The animal was so dormant that it was supposed the shell was empty. In the museum manner of that time, it was pasted on a labelled card and mounted in a display case in the British Museum. Four years later an attendant noticed that the animal was coming out of its shell and was still very much alive. It was fed some cabbage leaves and, apparently none the worse for its long sleep, this little Rip Van Winkle calmly went about resuming its interrupted life.

The nocturnal and hibernating habits of our native land snails are one reason why not many people, especially in the United States, are aware of their existence. Another reason is their comparative lack of economic importance. They do not eat

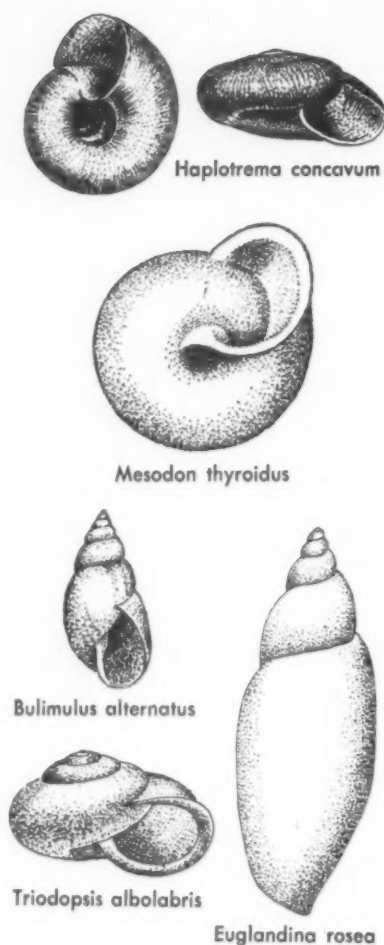
← The white-lipped land snail, *Triodopsis albolaris*, one of the commoner land snails of the eastern United States.

All illustrations by Anthony D'Attilio

what we like, but subsist largely on woodland vegetation, usually when it is decaying, and on the minute mycelium of forest fungi. They contribute their tiny share to the endless circle of life and death by eating the rotting forest leaves and thus help to break them down to their simplest chemical essentials. In this manner they aid in keeping the forest ground relatively clear of fallen leaves which might otherwise pile up in impenetrable masses. Just what proportion of this type of work snails do in comparison with other organisms has never been determined. But it may be safely assumed that it is not very large.

Land snails form part of the diet of birds, frogs, toads, snakes, and small mammals like chipmunks, field mice, shrews, and moles. The snail collector frequently comes across fresh shells with broken spires, from which the soft parts have been extracted, the work most likely of hungry forest rodents. One finds eight to ten mutilated shells to every living one in good condition. Hence it can be seen that the human searcher is a good deal less skillful a hunter than his animal competitors. In England there are certain "feeding rocks," which birds use against which to bang snail shells till they break and can get at the soft flesh within. The ground around these sacrificial boulders is strewn with fragments of broken shells. In the recent moving picture film called "*Chico*" we see such an event actually taking place. A roadrunner, a southwestern bird of the cuckoo family, in this case seized a small, white, elevated shell (evidently of the Texas genus *Bulimulus*) in its long, pointed beak and hit it repeatedly against a boulder till it fell free of its calcareous cover. It seized the tiny morsel again, gave it a quick shake or two to free it of adhering bits of broken shell, and then swallowed it with an upward toss of the head.

Besides constituting the prey of the animals mentioned above, snails are also consumed by beetles. Some of these beetles of the subfamily *Cycharinae*, which live in the Great Smoky Mountains of Tennessee and North Carolina, have their heads and mandibles elongated and specially constructed to be forced into the aperture of shells to get to the soft body within. Evidently snails are



their main source of food. The only other animals that live largely or even entirely on snails are other snails—flesh-eating species that dine off their herbivorous relatives. These predatory mollusks belong to the genera *Haplotrema* and *Euglandina*. The former has a yellowish-green shell about three-quarters of an inch in diameter. It is quite flat. It lives in the forests wherever its victims, namely other snails, can be found. It moves quite rapidly for a snail and attacks its prey with most un-snail-like ferocity, forcing its slender body into the aperture of the food snail and consuming every morsel to the very tip. In the case of smaller snails it devours them entire, shell and all. *Euglandina* lives in the South, mainly in Florida. It has a high, stout, spindle-shaped shell, pinkish or reddish buff in color and much the same ruthless habits as *Haplotrema*.

The interested reader might perhaps like to know some of the species

of land snails that can be found in his neighborhood. The late Dr. Henry A. Pilsbry of the Academy of Natural Sciences of Philadelphia, who died very recently at the age of 94, of which 75 years were devoted to the science of Malacology, has written a monumental work in four large tomes on the land mollusca of our country. In this work he describes exactly 1,141 species of native land snails, and more are being discovered and named every year. Nevertheless it might be of some value to describe briefly the outstanding groups that can be found in the various sections of our country.

In the eastern part of the United States, the largest land snails belong either to the genus *Triodopsis* or *Mesodon*. Both genera belong to the exclusively American snail family Polygyridae. The two commonest and most widely spread species are the common forest snail, *Mesodon thyroidus*, and the white-lipped forest snail, *Triodopsis albolabris*. Both have depressed shells—not elevated like the Texan *Bulimulus* that went to feed the roadrunner. They are about three-quarters of an inch high and one inch in diameter. The size, however, varies greatly in different specimens, depending upon the type of habitat in which it was found. Snails are usually smaller when they live in the largely granitic areas of lower New York because of the absence of calcium carbonate to build their shells. In the calcium-rich areas of upper New York and the mid-West the same species grow larger and heavier shells.

Both *Triodopsis albolabris* and *Mesodon thyroidus* live everywhere in the eastern part of North America as far west as the Mississippi River and, at least with *Mesodon*, as far south as northern Florida. In the region of the Great Smoky Mountains and Mt. Mitchell live many relatives of these snails. Here can be found *Mesodon chilhowensis*, called the "Queen of the Mesodons" because of its large size and impressive appearance. (Incidentally, it could just as well be called the "King of the Mesodons," for almost all our land snails, big and little, are hermaphroditic. This, of course, gives them a great advantage in the struggle to survive on land, since every individual is an egg-bearer—there are no useless male drones.) Many of the

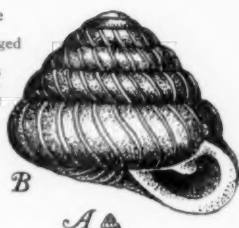
Mesodons here are smaller than *thyroidus*, some are a good deal larger, but all more or less resemble one another. Here too is the metropolis of the interesting genus *Stenotrema*. These are small, less than one-half inch in diameter, and have rounded shells like elliptical druggist's pills. They have a narrow mouth (hence its name, which in Greek means "narrow aperture") which is usually guarded by a strong, white, shelly ridge.

In the eastern part of the nation we also find the alternate forest snail, *Anguispira alternata*, a very pretty shell covered with dull reddish flame markings. It is about the size of *Mesodon*, but it never develops a reflected lip about the aperture even when it is fully grown. It has the same habits as the others but tends to be less solitary and lives in sizeable colonies. It is found more frequently in city lots than the other two. In the Greenwood Cemetery in Brooklyn lives a brightly colored subspecies of this snail called *A. alternata fergusonii*. It was named for an enthusiastic collector of the early twentieth century.

Although there is hardly room even to mention the name of the other snails that inhabit the eastern part of the continent, we must at least call attention to the tiny snails, from one-and-one-half to four millimeters in size. They are found literally everywhere in suitable conditions. Most of our land shell species are of this diminutive size. They appear in many interesting shapes and colors. Some of them look like tiny insect pupae and hence are called *Pupillidae*; some look like truncated pine cones, for which reason they are called *Strobilops*, which is Greek for such an object; some are like tiny grains of rice, for example, *Carychium*. For the most part the story of these tiny creatures is a mystery; very little is known about their life cycles, their habits and their place in the economy of nature. When such a snail does get to be studied, surprising and important facts are discovered as in the case of *Cionella*, the innocent vector of cattle disease. One can only wonder how many more such facts remain to be discovered in the life histories of the other tiny snails.

As one travels southward, the land snail fauna gradually changes. In

A—Actual size
B—Greatly enlarged
All other shells on this and opposite page are actual size.



Strobilops labyrinthica



Carychium exiguum



Anguispira alternata



Cionella lubrica



Liguus fasciatus

southern Georgia and Florida, snails of the genus *Polygyra* begin to appear and become the dominant form. These are much smaller and flatter than *Mesodon* and *Triodopsis* and frequently consist of many narrow whorls, whence their very apt scientific name which means "many whorled." Many *Polygyra* species have the aperture obstructed by an amazing series of tooth-like ridges and extensions that presumably serve to protect the soft parts from insect, chiefly beetle, attack. One species is called *Polygyra auriformis* because its aperture with its protecting extensions looks startlingly like a tiny human ear. Every unimproved lot in Miami, Florida, where plant debris has been allowed to accumulate has large numbers of some small polygyrid.

Traveling still farther south we reach the area of *Liguus*, the most beautiful land snail in America and one of the handsomest in the world. They live high up in trees, but descend to the ground to lay their eggs.

During the dry season they estivate by attaching themselves to tree trunks with a slime that hardens to rock-like consistency. *Liguus* is a large snail, the largest in our country, between two and three inches in height. It has an elevated shape like its related form the *Bulimulus* of Texas. The base color is a gleaming white like expensive porcelain. This is decorated with brown, orange, yellow, violet, and green bands of varying width. These bands, from Latin *ligo*, are the reason for its euphonious name. Many shells also have vivid flame-like markings. A collection of these snails is one of the most beautiful sights in natural history.

Liguus, a member of the widely distributed family *Orthalicidae* was originally an immigrant from Cuba, from whence it came sailing on floating tree branches impelled by the wild force of hurricane winds. When these were stranded on the keys and hammocks of southern Florida, the snail passengers disembarked. In the course of the centuries they developed into races of *Liguus* that have become characteristic for even such tiny localities as small, water-surrounded hammocks or islets in the Everglades. Many of these isolated snail populations have been given subspecific and varietal names. Some are so scarce that *Liguus* fanciers pay fat prices for coveted specimens. Destructive Everglade fires, the consequence of large-scale draining activities, have destroyed completely many of these beautiful local forms. Specimens of these vanished races, like rare stamps, command especially good prices.

The story is heard that occasionally unscrupulous collectors will come across a new race in some unexplored hammock. They collect all the specimens they possibly can and then set fire to the hammock, destroying the eggs and immature shells (as well as everything else). In this way they insure themselves that their special *Liguus* race will remain scarce and expensive. We like to call this fact deliberately to the attention of people who are opposed to capital punishment for criminals. It is comforting to know that with the recent establishment of Everglades National Park, *Liguus* will continue to thrive at least in part of its former range.

—(To be continued.)

Do Animals See

By David Gunston

DO ANIMALS see colors? It is an interesting question, hard to answer fully and conclusively. We, who see everything colored, can scarcely imagine a world totally devoid of color. For this reason we tend at first to assume that all other creatures see the same multi-colored scenes that we do. This is not so, of course.

Color is, in itself, such an arbitrary, intangible thing, and color sense a faculty so difficult to test or explain, that it has always been difficult for scientists to expound about it with assurance. No object really

contains color, it merely absorbs the white light of daylight, as everything does, reflecting back only one of the components of that light of the spectrum. Thus a green leaf absorbs all the hues of the spectrum except green, which it reflects, thus appearing itself to be green to our eyes. And again, just try to explain to a blind person what red is *without* the use of comparison. It is quite impossible. Quite apart from the widespread prevalence of partial or minor human color-blindness, and the different interpretation put on the same intrinsic color by different people, it is also well to remember that our sense of color appreciation is still be-

ing developed, and is changing all the time. For example, Homer always called the sea wine-red, and the ancient Greeks frequently referred to the normal human face as green!

Ultimately, everything depends on the optical receiving apparatus involved. A slight defect or variation there, and the person concerned may be partially color-blind—perhaps owing to the lack of one of the three light-sensitive “pathways” from the retina to the brain. Each transmits its own primary color—red, green, or blue. Most people we call color-blind are in fact only partly so, having the green pathway missing, while a much smaller group lack the red

Photograph of spring peeper, *Hyla crucifer*, by Leonard Lee Rue, III.



C @ L @ R S ?

pathway, and so are red-blind. These variations are physically very slight, and are confined entirely to what we know as the nervous system: there is thus the strongest evidence that animals, many of which have eyes closely similar to our eyes, lack these small features which give a color-sense entirely.

From all this it will be seen just how difficult it is to apply our own limited and tentative knowledge of color vision — always remembering that we, ourselves, may in some slight respect be color-blind — to other creatures. The subject is one that has provoked a great deal of research, much of it inconclusive. It

is endlessly difficult to be dogmatic about whether an animal can see a color. No animal can reply articulately to a direct question. Furthermore, in almost all tests made with animals it is difficult to be absolutely sure that the subject of the experiment is not choosing or distinguishing between the colors shown by brightness or whiteness, and not by color. For that reason, any test that is to be of value must employ colors of identical brightness and proportion of whiteness. Otherwise, the creature, particularly if it is an intelligent one, may distinguish between red and green solely by brightness, just as many color-blind human

beings do in tests for color-blindness.

But within the obvious limitations, we do know something of the subject. Enough, for instance, to say quite definitely that almost all the mammals, with the notable exceptions of the apes and the monkeys, do not see colors at all. They live in a world of blacks and whites and a fair range of grays. What they do often see quite clearly is the difference in the intensity of the blacks, and in the light intensity of the whites and grays, which not infrequently leads people into thinking that animals, like dogs, must in fact see certain colors. How many times has a fond owner of a pet dog sworn that

Honeybee at flower photographed by Lee Jenkins.



his or her animal can always recognize a certain coat or dress when worn by someone the dog may not know, or can tell a particular dish or cushion solely by its color! It may sound strange to live in a monochromatic world, but most mammals are nocturnal, or at least crepuscular, in habit, venturing forth only when the world itself is a shadowy, dark colorless place, lit only perhaps by the pale deceiving light of the moon. But we ourselves might not find it so very strange. We have never thought ordinary black-and-white movies unnatural, and most newspaper and magazine photographs are still reproduced in monochrome, yet we recognize them as a reflection of life. Even a simple black-and-white line drawing may be uncommonly natural and vivid to our eyes. For all the human passion for color, we feel its absence less than we imagine.

Dogs, cats, rabbits, rats, horses, sheep—even bulls—we are certain do not know color in our sense of the term. A great many experiments have been made on the color vision of bulls in Spain, in connection with

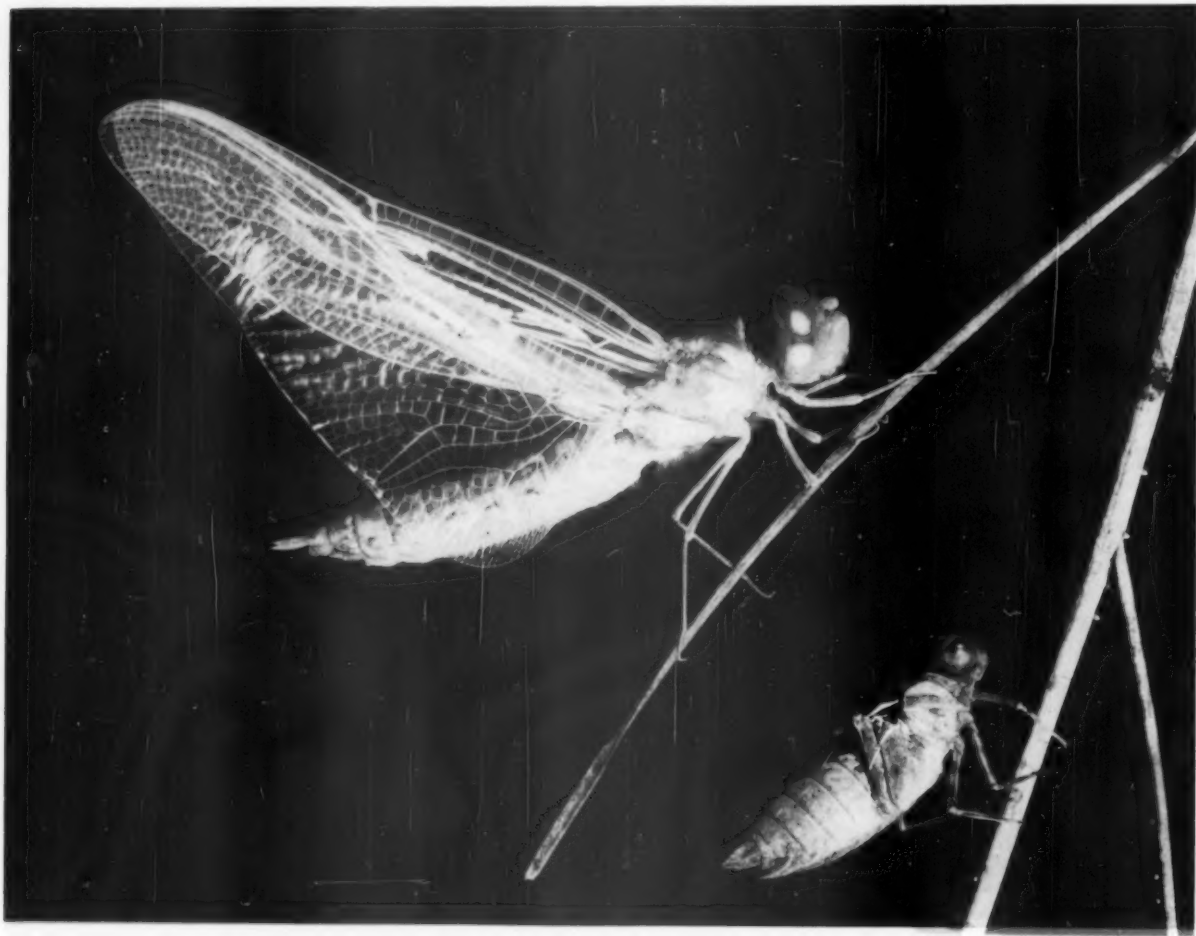
bull-fighting technique, and though they have all shown that no bull can distinguish red as red, clear and distinct from any other shade, and that bulls generally are not in any way sensitive to red, the age-old art of the toreador and his *aficionados* with their red cloaks is unlikely to be changed. The red cloak is part of the tradition of the sport and will doubtless remain, even though those who use it know full well that it is the fluttering, taunting sight that induces the beast to charge, not its color. A bull determined to charge will do so regardless of what color is dangled before it.

A good deal of experimenting with other mammals have achieved similar results, particularly with cats, horses, rats, and dogs. The tests usually take the form of training the animal to associate food with a particular color, while showing it at the same time another color unaccompanied by food. When the creature makes the correct choice more often than not, the color with no food attached must be gradually changed in intensity to make sure that

it is not only relative brightness that influences the subject's decision. If, at a certain stage in this color "training" a change in brightness is reached where the animal's reaction breaks down and it expects food equally on either color, we can say with certainty that it is color-blind, at least by human standards. On the other hand, if the training holds, and the creature invariably picks the correct color to obtain food, however much the intensity of the no-food color is altered, then we can deduce that it is able to distinguish that particular pair of colors one from another. However, this is far from conclusive evidence on color vision, so the animal must then be retrained for another quite different pair of colors. Such experiments are inevitably lengthy and difficult, and always care has to be taken that external influences such as smell, noise, position of food, time of the day, presence of other colors, and distracting lights, etc., are avoided.

Nevertheless, such tests have clearly shown the inability of mammals generally to recognize colors, and the

Newly-emerged dragonfly and its nymphal shell photographed by G. Ronald Austing.



fact that the apes and the monkeys do have good color sense. In this connection between two groups of mammals, it is interesting to note that these color-conscious species are the only ones to have really bright colors on their own bodies. (It might also be claimed that they have higher intelligence, but there is no correlation between a creature's intelligence and its color sense — birds, fishes, reptiles, and insects can in many cases see colors.) One thinks immediately of the bright blues and pinks of the mandrill and other apes, whose significance in courtship rites is well known. Most other mammals have bodies of duller hue: drab grays, browns, black, fawn, in endless combinations, or white itself, which we believe were largely evolved for unobtrusiveness or natural camouflage. Where a brightly-colored animal is seen, it is usually the result of human interbreeding, as with dogs, cats, and cattle, or else the natural camouflage shade of a creature viewed away from its habitat. The red of the dog fox, the chestnut of the squirrel, the golden-brown of the bear all merge harmoniously into their natural backgrounds. In fact, it is a rough guide to color vision in nature, this presence of bright colors on a creature, if allowance is made for the possibility of natural camouflage.

We see it most clearly shown with the birds. They are quite different from the mammals, and can see most colors with a vivid intensity. The striking plumage of almost all birds plays a big part in their courtship display, which is ready proof of their ability to see bright colors. Whether Darwin was right in supposing that the bright coloration of male birds has a survival value by being attractive to the female is a matter for conjecture. What is obvious is the part such plumage plays in a bird's life.

Birds generally see yellows, reds, greens, and oranges most clearly. They cannot distinguish blues so well — witness the comparative rarity of really bright blue birds — while very few birds can see violet, as far as we can tell. That shade is even less common on a bird. In addition, where blues or purples do occur in avian plumage, they are nearly always very brilliant, as with jays, kingfishers, and macaws, which seems to suggest that these shades can only be distinguished by birds if they are unusually bright. But the Australian

lyre-bird, that feathered oddity of great beauty and mystery, can distinguish both blue and violet, for it goes out of its way to select flowers of these colors with which to adorn its arbor. In the main, however, it is *brilliance* of color that attracts a bird, whether it be some conspicuous patch on a mate's or suitor's plumage, the petals of a flower, the shining beam of a lighthouse at night, or the glitter and sparkle of bright objects which jackdaws and magpies steal and hide away.

Experiments on birds have been rather fewer than on mammals, possibly because their ability to see colors is so obviously demonstrated by their own persons. They have also been almost completely confined to those species which can be kept in captivity with ease. One interesting series of experiments with the ordinary domestic hen does, however, illustrate the peculiar pitfalls present with color vision tests on birds. Grain was placed before the hens and illuminated by a spectrum of colored lights. They immediately ate all the red, green, and yellow grain, but left that in the blue light, from which it was not unnaturally concluded that these birds, at least, were blue-blind. Only later was it discovered, by further tests, that hens would eat blue grain with a little persuasion. The only reason why they were originally shy of it was that they never normally touch any kind of blue-colored food.

Some fishes can see certain colors. Perch, trout, shanny, minnows, and others have been proved by tests to be able to recognize a fair range of shades. Perch and other species have been regularly fed on red-stained larvae, and then easily deceived with red wool, while similar tests have been successful with food dyed yellow, orange, green, and brown. There is good evidence, too, that prawns and shrimps have a color sense. Probably all those fish species which can change their color to match their surroundings can see those, and possibly other, colors. Curiously enough, however, no conclusive tests have

been made with chameleons, in spite of their well-known color-changing ability, although this creature probably does see some colors. Turtles have the faculty, and so have many lizards. Lizards known to detest salt have been trained to reject salt-soaked mealworms on paper of several different colors. On the other hand, frogs appear to be totally color-blind—or else not intelligent enough to be suitable subjects for experiment.

Insects generally have a color sense, but it varies considerably with species. There have been more tests on the color vision of bees than any other creature, which is hardly surprising in view of their value as pollinators and honey-producers. A simple experiment with bees was conducted as follows. Small squares of gray paper of different shades but equal brightness were set like the squares of a draught-board, and one blue square was included in the middle. Each square was fitted with a tiny food dish, but the blue square's dish had syrup in it. After lengthy trials a bee could be taught to fly straight to the blue square, even when its position was moved about the board. Yet when a red paper of equal brightness replaced the blue, the bee was flummoxed, and could not tell it from the grays. Bees are not only blind to reds: they live in a world of blues, purples, and yellows only, but they (and other insects) can see further into ultra-violet than we can. Many pollinating insects are, of course, attracted to flowers as much by scent as by sight of colors—witness the popularity of willow, ivy, and lime flowers to bees. As a rule only those insects with highly developed, multi-lensed eyes have good color vision. Dragonflies probably have the best color-sense in the insect world, with perhaps hoverflies, and some butterflies and moths, as runners-up. Houseflies know blue, and dislike it enough to avoid blue-washed windows, or blue walls and curtains, while mosquitoes, which are known to distinguish yellow, white, and black, appear to prefer the last-named color. In a special test made in an infested region in Oregon, seven men wore shirts of different colors. Within half a minute a black shirt had attracted the most insects—1,499 to only 520 on the next most-heavily infested shirt, a white one!

—THE END



The Singing

WOOD-RAIL

By Alexander F. Skutch

(Part II)

ON the other side of my Costa Rican house, beside the coffee grove, grow some pejibaye palms, whose tall, slender trunks, bristling with long, needle-like, black thorns, bear spreading crowns of graceful, plummy fronds. The fruits, about the size of plums, are borne in heavy, compact clusters just below the leaves. When they begin to ripen in July or August, tanagers, finches, woodpeckers, and other birds flock to feast on them, and they drop to the ground many fragments and half-eaten fruits, in addition to a few that are whole.

The wood-rails venture forth from the neighboring streamside thicket to devour these fragments made available to them by the smaller birds, but they are so shy and wary that I have seen them do this only while I was hidden in a blind. In the course of one morning, I witnessed four visits by a rail, whether always the same individual I could not tell. It never stayed in the open long enough to swallow its prize, but each time it hurried off holding the whitish fragment of fruit in its bill. On the first three occasions it carried the morsel right back into the thicket beyond the palms, but on the fourth it walked through the edge of the plantation, between the coffee bushes, taking long strides and looking cautiously from side to side, then breaking into a run as it neared the bank of the stream, into whose dense shrubbery it vanished. With its long red legs, rich chestnut breast, big red eyes, and green and yellow bill, how bright the rail appeared as it crossed the open spaces of the plantation!

Pejibayes are edible by humans only after they have been well cooked, preferably with salt; for when raw they sting the mouth. But

the birds appear not to be troubled by the stinging sensation, if indeed they feel it. Dry maize and pejibaye fruits are the only foods that I have seen the rails eat, although doubtless their diet includes a variety of insects, worms, frogs, lizards, small snakes, and other creatures that they find beneath the fallen leaves which, as I once witnessed, they push aside with their bills. One day while I watched a royal flycatcher, a wood-rail jumped with a noisy splash into the shallow rivulet above which her long nest hung, frightening her from her eggs. Apparently the rail was trying to catch a minnow or a tadpole.

The wood-rail's nest is a large, compact mass of dead leaves and twigs, measuring from 12 to 14 inches across the top and, in the bulkier examples, about 9 inches in height. In the top is a shallow depression, whose depth is sometimes less than the thickness of the eggs it holds, and this is lined with twigs. This nest resembles the masses of dead leaves and branchlets that frequently accumulate in the tangles of vines, and I should not have paid much attention to the first that I found if a rail had not slipped from it as I approached.

The three nests that I have seen in the valley of El General were at heights of from 6 to 10 feet in dense, vine-laden thickets or light second-growth woods. Each contained three large, strongly ovate eggs, about two inches in length by nearly an inch-and-a-half in diameter, which were dull white, spotted and blotched with bright, rusty brown and pale lilac. These markings were heaviest on the thick end but sparsely scattered over the remaining surface. All of these nests were discovered in the early part of the rainy season, from mid-April to the first week of July.

On the island of Trinidad, according to Belcher and Smooker, this wood-rail builds a deep bowl of small

twigs, dry weed stems, fibers, and leaves, which it lines with green bamboo leaves. These nests are placed from 3 to 20 feet above the ground, or at times over the edge of a waterway, 8 feet or more above the surface. These authors found eggs from late May well into August, and the sets were larger than I have seen in El General. They considered 5 to be the normal complement, but they found up to 7 in a nest, and at the other extreme sets of only 3 or 4 eggs, which they surmised were second layings.

Belcher and Smooker believed that if a nest is touched by a human hand, the rail sometimes destroys the eggs and deserts it, and this may happen if the sitting bird is merely suddenly flushed. My own experience is somewhat different. When I found my first nest, in a tangle of climbing razor-sedge in light woods near the coffee plantation where I saw the rails eat pejibaye fruits, I picked up the eggs to measure them; yet afterward, the rails continued to incubate. On the following day one of them watched me from the nest while I looked at it from a distance of only 3 or 4 yards. Hoping to learn something about the chirincoco's domestic arrangements, I then set up a blind and screened it with leafy boughs; but this caused the rails to stay away. When, later in the day, I found the eggs cold, I promptly removed the offending tent; but still the birds refused to return to their nest.

The second nest, 10 feet up in a very dense tangle of vines in a spreading tree, was discovered by a laborer while cutting down the light woods to plant bananas. The rail continued to incubate while he worked, noisily felling the trees, and it slipped from the eggs only when he cut two tall saplings so close that they fell against the vines in the midst of which it sat hidden from

view. When the boy took me to see his discovery, the rail, which had resumed incubation, remained at its post while we stood beneath the nest. It unobtrusively vanished when I turned my back to cut a stick to which I might attach a mirror that would reveal what the nest held. Next day incubation continued, at the very edge of the new clearing, where work had been suspended for the benefit of the rails and the studies which I hoped to make. But two days later the eggs had vanished. They were probably taken by some predator.

My third nest, situated 8 feet up

in a dense tangle of bushes and vines in a low second-growth thicket, not far from a rivulet, was without eggs when I found it on May 18, 1947. By half-past seven on the morning of May 22, 3 eggs had been laid. In the ensuing days, 4 times I found a rail sitting on them, so well concealed by the leaves that clustered thickly around that I could see nothing of it save from a single point, where a gap in the foliage permitted a view of its head from the eye up and part of its bill—nothing more. It sat motionless and steadfastly returned my gaze. I never touched these eggs, viewing them only in a

mirror raised on a stick; but by May 29 the nest was empty, with fragments of the shells scattered over the ground below—the work, I believed, of some mammalian predator. Because of the premature loss of all my nests, I have never seen the chirincoco's newly-hatched chicks, nor have I ever met parents leading downy or half-grown young through the woodlands or thickets.

In May two years ago, while prowling through the dense, bushy growth across the creek where the wood-rails live, I discovered a platform composed of dead leaves, weed stalks, and coarse bits of vegetation. It was 6 feet up in a bush at the edge of the marshy opening, and was 10 by 12 inches across the top and about 4 inches thick. The top was hard and compacted, as though it had long been in use, and so flat, without the least rim, that an egg placed upon it would have been in danger of rolling off. Although canopied above by a tangle of vines, it was completely exposed on the side toward the marsh, from the farther edge of which it was visible.

I suspected that this was a rail's sleeping platform. After nightfall I waded the stream and stole up to it as silently as the tangled vegetation permitted. When in a favorable position, I threw the beam of my flashlight upon the platform. There, sitting beneath the canopy of vines, staring into the blinding rays with big red eyes and nervously twitching its short tail, was a chirincoco, whose sleep I had interrupted. After taking one good look, I extinguished the light and crept away as quietly as I could.

Next day I returned to look for the dormitory of this bird's mate, or its nest with eggs; but my search was fruitless. Since the surrounding thicket was so dense that I could scarcely move without opening a path with my machete, and visibility was limited to a few yards, I might have passed close by what I sought without finding it. After making this discovery, I have often wondered, when the *chirin co co* song rings out in the night, whether the rails are performing on their sleeping platforms or wandering over the ground in the dark. This is one of the many questions about the life of the elusive chirincoco which will doubtless long await an answer.

—THE END.

NATURE IN THE NEWS

Continued from page 65

From the program at its completion comes an understanding of both conservation and another tenet of Audubon philosophy—we know that soil, water, plants, and wild creatures depend upon each other and are vital to human life.

The Audubon program offers an opportunity to escape to reality.

WHEEL OF LIFE

The final lecture of the two weeks presented "*The Wheel Of Life*," which finds in balance—minerals in the soil unlocked by green plants, plant eating animals, predatory animals and scavengers. Man was pictured in the center of the wheel and is admonished he can either make it or break it.

The laws of nature are as they always have been and unless man understands and observes them our complicated civilization of human society is threatened.

All this study of nature is no laborious task, but intensely interesting instruction carried on in the great outdoors in a delightful section of the Sierra Nevada.

Campers are kept busy with morning, afternoon, and evening sessions, the latter indoors, except for study of the stars, and usually lectures or motion pictures presenting information on natural history, together with social features.

Of the 54 who comprised the fifth session, 24 were teachers, 2 school administrators, 1 librarian, 4 youth organization leaders, 3 students, and the balance miscellaneous. Addresses showed: northern California 28, southern California 13, Arizona 2, Illinois 2, Nevada 1, New Mexico 1, Texas 2, Virginia 1, Washington 4.

The natural setting of the Sugar Bowl, a noted winter sports center, provides the trees, streams, lakes, and mountains needed and for study of species not in the immediate area there are trips by

station wagon to Boca Reservoir, east of Truckee, and to Washoe Lake, Steamboat Springs, and Mt. Rose south of Reno.

Campers are divided into groups of 12 to 15 and spend three half days with each of five leaders, all with degrees in biology, zoology, or kindred subjects and all teachers, some in state colleges and others in high schools and elementary school programs.

Directing the camp and program is William Goodall, Pacific coast representative of the National Audubon Society. A philosopher and humorist, in addition to his purely professional qualifications, he is today's Will Rogers and his personality gives the camp a strong appeal to all who come under his influence.

The camp has many customs and traditions which enliven and make pleasant and profitable the days spent there. These should not be revealed else the edge be taken off for the "first timer" when he learns them.

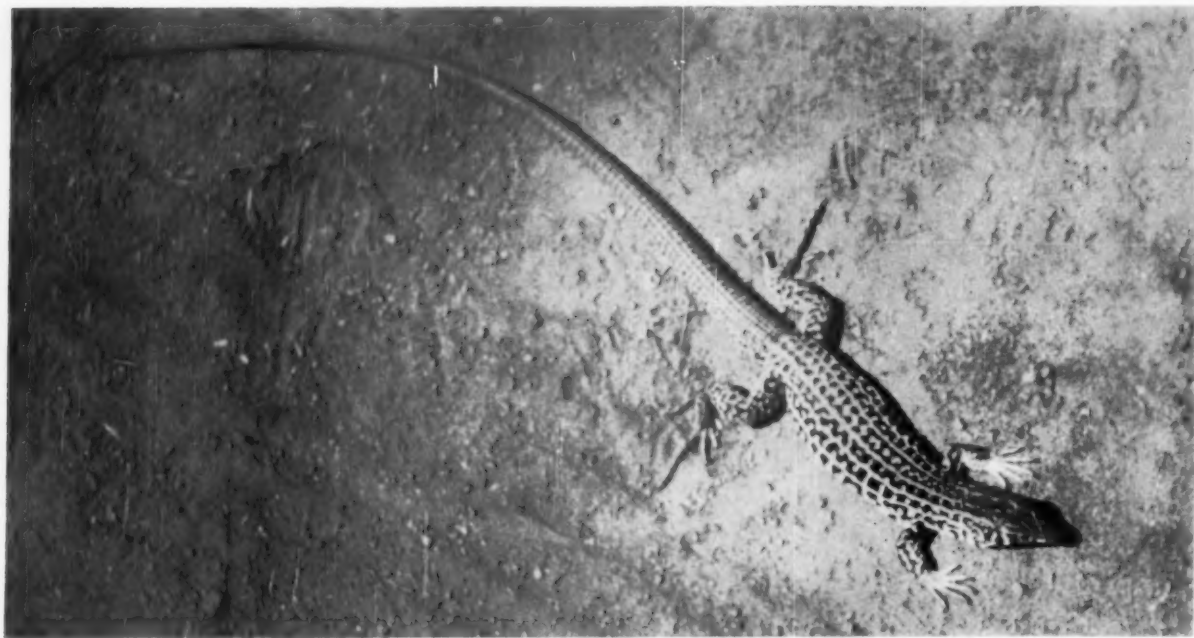
TEACHERS, LEADERS

In these days when education is so much in the public mind it was interesting to return to the status of pupil. From the experience came confirmation of a truth which should be universally recognized—the importance of the teacher to the individual pupil and the class. The teacher is all-important. Whatever the method, whatever the program, its success depends on the teacher. This is recognized to a far greater degree by adults than by the younger generation, who comprise most of the pupils.

Our leaders were outstanding teachers, dedicated to nature and to teaching. They had an additional burden of dealing with adults who had, for the most part, not been pupils for a long time. Their qualifications and their interest, their special training in the Audubon program and especially the influence of "Bill" Goodall, aroused and maintained the interest of their pupils and left

Continued on page 96

WHIPTAIL LIZARD— A CHAMPION SLEEPER



This adult female whiptail lizard was the tamest one in the author's garden.

All photographs by the author.

By Frank F. Gander

IT is not surprising to learn about animals of high mountains and the Far North which remain in hibernation for more than half of the year, but to find in the mild climate of coastal southern California a lizard which is active for less than four months of each year, was to me, astounding. Yet, this is the pattern of life of the adult whiptails of my garden. They come out of hibernation in mid-April, and retire into estivation by the end of July. Thus, more than two-thirds of their adult lives are spent in sleeping.

By the discovery of such a sleeper, I first learned that whiptail lizards* inhabited my southern California acre. Just after I had purchased the land in the fall of 1951, I was doing some leveling. I uncovered a dormant lizard of this species about 16 inches under the surface of the

ground in the abandoned burrow of a kangaroo rat. I placed it in the sunshine in the hope that it would warm up and then run away and find a new home for itself. It did show signs of life, occasionally moving its legs lethargically and pulling its body along for an inch or two, but it gave no indication of becoming more alert.

During the following spring and summer, I frequently saw whiptails of various sizes in my garden. At first they vanished at high speed into the brush whenever I came near, but after the first of June, when I began working about the place daily, they became accustomed to me and fled less readily. By the next summer of 1953, they were tame enough so that they just moved out of the path as I came along and no longer ran from me. With this better opportunity to observe them, my interest increased, and I observed them more closely. In the fall, I noticed that only young animals were about, and I wondered what had become of the adults.

In the spring of 1954, I eagerly awaited the appearance of the first whiptail, which appeared on April 19. From then on, I saw them regularly whenever the day was sunny and the temperature was 70 degrees F. or above. As many as eight adult and sub-adult individuals were in sight at one time. One large, brightly-colored male was very pugnacious and chased other males whenever he saw them. He was not afraid of me, and by tempting him with mealworms, I soon had him eating out of my hand. One young male and several females also learned to feed from my hand.

On May 26, I saw the old male and the tamest female stretched out in the sunshine, side by side, in front of my lathhouse. The abdomen of the female was noticeably distended at this time. For two days, this pair were together; then for a few days I saw only the male. After a week had passed, the female appeared. Her abdomen was extremely deflated, so much so that she scarcely looked like the same animal, but

* According to the author, this is the coastal whiptail lizard, *Cnemidophorus tigris multicaudatus*, which is described on page 34 of "The Lizards of San Diego County," by Charles Shaw (Bulletin 25 of the Zoological Society of San Diego).—The Editor.

none other had been quite so tame as she.

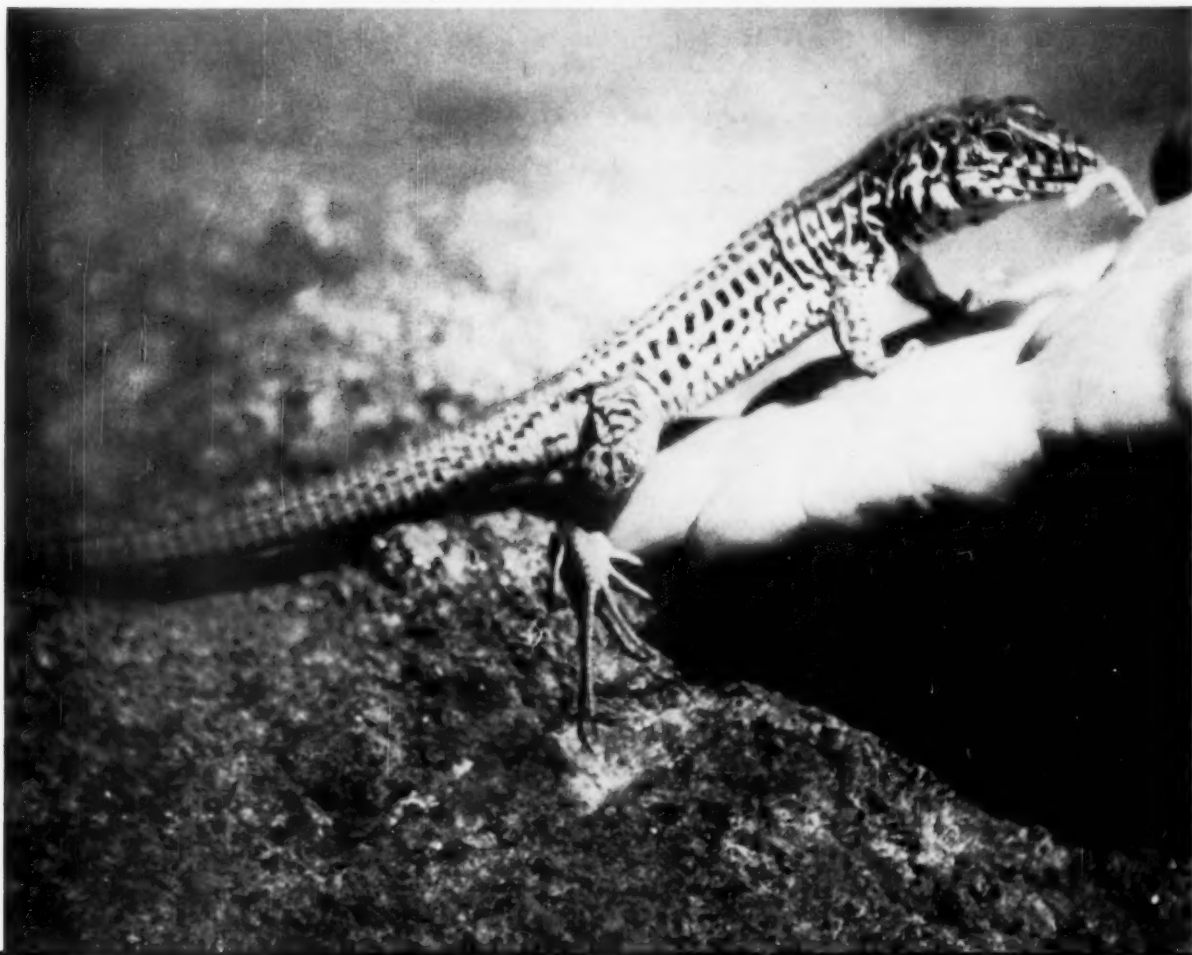
For some time, I did not see these two associating together, but I noted that the male was following other females. One of these that was slightly under adult size, turned and twisted, first one way and then another, as if trying to elude the male, and occasionally she would leap into the air, rising nine or ten inches and covering a forward distance of a foot or so. The male continued to follow her, however.

By June 22, the tamest female was again very fat, and I wondered if this was the result of her being fed so many mealworms. On the following morning, soon after the sun broke through the overcast, while I was sitting watching the birds at a feeding station, the tamest female came to me followed by the big male. I fed them mealworms, and the female climbed about all over me. Another male came past, and the tame one rushed at him and drove him rapidly away. Whenever the female was on the ground, the



The author nails a bird-nesting box to the side of his nursery lath-house.

An adult male whiptail lizard takes a mealworm from the author's hand.



male was definitely courting her, following her closely when she was moving, rubbing against her whenever he could. When she came to rest, he would crawl close beside her and sometimes put his foreleg over her or rest his head on her shoulders.

The male became more and more excited and finally did a short dance. Making narrow figure eights of about his own length of one foot, he whipped through them very rapidly, shimmying violently the whole time. This lasted for about 10 or 15 seconds; then the female moved away with the male following her. They came to a little bowl-shaped depression such as quail leave where they have been dusting, and it was there that mating was consummated. The male did not take hold of the female with his mouth nor did he make any attempt to force her to submit to him as male lizards are reputed to do. It was 10 minutes before they moved away into the brush, and the male again followed closely behind the female.

One week later, on June 30, the female appeared after having been missing four or five days. I noticed that she had lost her fat, and assumed that she had laid a clutch of eggs. As the same loss in size had taken place just about a week after the first time the male was seen closely associated with her, it seems probable that this was the second laying for that season. Surprisingly, it seemed to me, on both occasions the body of the female was noticeably distended before the male was in attendance on her. Apparently, the ova of any laying develop to considerable size before they are ready for fertilization.

By July 4, the female had lost her deflated appearance and was even slightly plump. However, I was surprised to see the male following her closely again for she was not nearly so large as she had been on previous occasions when the male attended her. They again mated, this time on level ground about six feet from me where I could watch it closely. At no time did the male bite the female nor use force. On the following morning, the male was attempting to go into a small burrow such as the whips use at night or for hibernation and he was driven out repeatedly. For several days I did not see the female; then, on the eleventh

she appeared looking like a collapsed balloon. She was very hungry and ate mealworms, a beetle, and a grasshopper which I gave her, but she showed no interest in a tree frog.

It is principally by their reactions to food offered them that anything has been learned about the feeding habits of whiptails, for seldom have I seen them obtain any food for themselves. I saw the tame female with a still wriggling Jerusalem cricket, and often I had seen them trying to catch side-blotch lizards, *Uta stansburiana*, but never have I seen them succeed. They eat most insects offered them, but always ignore the little crustaceans commonly called sowbugs and pillbugs. Whiptails forage continuously during those hours of the day when they are active, weaving erratic and winding courses through my garden, and touching the nose to the ground every few steps as if the power of scenting was important to them in hunting for food.

On several occasions, I have suspected that scent was the guide that led these whips to me. During May and June, if I wished to find the tame female, I would go into her territory and sit quietly. As a rule, she would appear in a short time, usually coming upwind, often through dense bushes and once over a large granite rock that rose higher than my head while I was seated. On still another occasion, she came into my office where I was typing and had left the door ajar about two inches. This was the first time I had noticed her around my office, and she could not possibly have seen me from the outside.

Of course, the sense of sight is very important to them, too, as both of these two tame ones repeatedly came to me when they saw me walking slowly. Also, they would come from as much as 20 feet away if I would squat down and hold my hand to the ground as though offering them food. They were understandably nervous if I was walking fast or with a number of other people, but did not hesitate to come right up to me, or to others, when standing still. The female would sometimes nip at the soles of my shoes if I did not offer her some food. In this and other ways, they repeatedly showed that they recognized the whole of me as a single individual.

During the summer, the number of whiptails in my garden decreased markedly, but whether this was due to the aggressiveness of the tame male or caused by a roadrunner which visited my garden frequently, I could not tell. The summer previously, I had seen a roadrunner in swift pursuit of a male whiptail under my oak tree, but the lizard escaped under a rock after having dropped its tail in the melee. As the warm days of July passed, I saw even the tame ones less frequently. I saw the male for the last time on July 22, the tamest female on July 28, and another female that was growing a new tail, on July 30. I saw no adult whiptails after that date.

I still saw two-thirds grown young from the previous season's hatch occasionally during August and September, and on August 17, I saw a newly hatched baby whiptail. This was a tiny, slender little fellow with a bright blue tail. Others were seen soon after that, and they were around my garden frequently until late in September. By that time they had increased greatly in size and had lost the blue color of their tails.

As these whiptails disappeared from my garden, there was no way of knowing which had been taken by predators and which gone into estivation or hibernation. The tame male had been seen emerging from a deserted pocket gopher tunnel one summer morning, and on another occasion, the tamest female had been seen coming out of a similar tunnel not far away, so perhaps they were wintering in these places. I would not disturb them by digging in to find out.

During the winter, however, a spotted skunk did dig into the tunnel which the male had occupied, and I was fearful that my pet had been eaten. This assumption was borne out the following spring as the tame male did not appear.

Seasons will follow seasons, and I am looking forward to the time when once more I can spend much of each day among the lizards, birds, and other little creatures of my garden. I hope that some of the descendants of my pet whiptail will still be living there, and if they are, I am sure that they, too, will become as tame and trusting as their ancestor had been.

—THE END.

A Wildlife Sanctuary FOR YOUR COMMUNITY

Helpful suggestions for garden clubs, women's clubs, conservation, youth, and civic clubs, and other organizations that would like to establish a sanctuary.

By George H. Breiding*

BEFORE undertaking a wildlife sanctuary program, the group or committee in charge should ask itself the "Five W's" that a reporter unconsciously answers when covering an assignment: "Who, What, When, Where, Why," and in this case, "How?" In other words, what is the purpose or objective and how will it be accomplished? How will it be maintained and perpetuated? What will it accomplish and what will be the benefits?

LOCATION

Is the site, tract, or area already determined? If so, then future developments automatically depend upon a plan and a course of action. If the site is merely prospective, is it actually available? Is the organization able to obtain it by purchase, lease, or gift?

On the other hand, if a group must "start from scratch," it may be more advantageous. There will be an opportunity to investigate, survey, and finally acquire an area that is perhaps more accessible (this may be desirable but can be undesirable) and easier to control and maintain. Also an area may, by chance, be located that is endowed with a relatively natural wealth of birds, other animals, and plantlife, or a good potential without requiring extreme measures to develop, create, or restore suitable habitat.

SIZE

It's true that one's concept of a sanctuary can be anything from an oversized feeding station for birds to hundreds, or even thousands of acres. The size of a sanctuary, it seems, depends upon the resources, personnel,

and time that the sponsoring group has available. The size then becomes narrowed to: 1) What the group can adequately handle; 2) Animal biology and wildlife conservation.

The first point has been briefly touched upon. The second involves the birds and other animals themselves. If the group merely wants to undertake a project to attract birds artificially, we can stop here; however, if the intent is to go into a wide-scale program, then a knowledge of the birds and other animals of the region can be a guide. Most pairs of small birds have relatively small territorial requirements (each species needs from less than one, to several acres) for their nesting and feeding activities. These vary with the habits of the species, and may change with the seasons.

The proposed sanctuary should, ideally, be large enough to manage it so as to increase or attract animal species that are characteristic of the general region. The size will be determined by a combination of factors, but in its truest sense, the sanctuary should be planned and conducted to provide the most good for the greatest variety and number of birds and other animals. Again, knowing the habitat requirements of animals or acquiring a knowledge of ecology will help one to set up a management plan that is sound and practical.

TYPE OF SANCTUARY

The type of sanctuary is necessarily tied in with the locality, size, and the present use of the site under consideration. Perhaps the sponsoring group can enlist the cooperation of municipal or state agencies to develop a city or a state park, a forest, or a recreation area. If such a plan is undertaken many of the long-range problems of maintenance and protection may be eased, but they

may also introduce other ones that involve the relationship or personalities of the supervisors or administrators.

Occasionally, a sponsoring group will fail to get the aid or cooperation of public officials because the officials are not sympathetic to birds and other wildlife; the officials may be hamstrung by policy or precedent; they don't want to be bothered with working with an "outside" group. If the sanctuary-sponsoring group contemplates the use of a public area, it should carefully lay its course, make sure that public opinion and influential persons are in sympathy with the idea, and that a legally accepted sanctuary agreement is drawn and agreed to by the parties concerned. If the group feels that it should be granted the privilege of developing a sanctuary on public property, and the public officials resist or are apathetic, you will discover that these officials are usually sensitive to strong public opinion, especially the opinions of citizens with influence and prestige.

Another type of bird sanctuary may be an undeveloped block or a section in or near a downtown or urban area where it is available and can be called to the attention and utilized by many people. A sanctuary may also be established on an abandoned farm or an old estate that can be developed for the strict private use of the sponsoring group; or it can be opened to special persons or groups by invitation or upon request; or to full use of the public.

Finally, a sanctuary may be a remote, isolated, wilderness type where the purpose is that of a refuge or an inviolate area set aside for the welfare of a certain kind of wildlife. This may involve the protection or special management of its habitat by providing it with the proper requirements during the critical portion of the species' life cycle.

DEVELOPMENT AND MANAGEMENT OF THE SANCTUARY

A group that decides to take over an area must necessarily make long-

Continued on page 86

* The author has been Director of Nature Education at Oglebay Institute, Wheeling, West Virginia, since 1950. In college he majored in wildlife conservation, nature education, ornithology, and botany.
—The Editor

BIRD FINDING WITH

Sewall Pettingill

WHERE TO GO

WHEN TO GO

WHAT TO SEE



ICELAND

If you are flying to Europe in the late spring or early summer, how about going by Icelandic Airlines (the cheapest way by air to the Old World) and stopping off in Iceland for a few days of bird finding? Mark my word, here is a real opportunity that you shouldn't pass up! But more about that later. First let me tell you a little about our stay in Iceland, the country and its people.

My wife and I arrived in Iceland in mid-May, 1958, to make a new film for Audubon Screen Tours. Except for 13 days away in early June to attend the Twelfth International Ornithological Congress in Finland, we worked steadily until our departure date in late July. As you would expect, birds were our principal subjects. Dr. George Miksch Sutton from the University of Oklahoma joined us, on our return from Finland, to sketch and paint birds. I doubt that Icelandic birds* have been more thoroughly covered pictorially by any one party.

After eight weeks in Iceland, traveling to and staying in many parts of the country, I can say this: American misconceptions of Iceland are amazing. Despite its bordering on the Arctic Circle, it is no wilderness of ice and snow, but a virtually treeless land warmed by the North Atlantic Drift. While it has numerous glaciers

at higher elevations, it receives little snow—barely enough for skiing. We enjoyed summer days that were as sunny and warm as northern Michigan's. Among the human population of 165,000 there is not one Eskimo. The people are of Scandinavian descent, handsome and self-respecting, and they have their own language ("Icelandic"). Far from being simple fishermen and farmers who eke out a meager living, Icelanders are well educated (their literacy is just about 100 per cent), highly cultured (they publish and read more books, magazines, and newspapers in proportion to population than the people of any other country in the world), and remarkably prosperous (nearly all their homes have modern plumbing and electrical appliances). Along the highways we saw the latest models of European and American cars, and the best in road-building machinery. In Reykjavik, the capital city, the women and most men seemed to us better dressed than in London. Though Icelanders are said to be anti-American, we didn't observe the slightest evidence of it. They were consistently helpful, always friendly, and in various ways showed great admiration for the United States. I seriously doubt that the average Icelander is anti-anybody; but he is decidedly pro-Iceland, for he takes an enormous pride in his nation which has a thousand-year history of democracy and, since 1944, has been entirely independent.

Roughly oval in shape with a total area equal to Kentucky's, Iceland is

mountainous country into which fiords cut deeply, except in the south where the coastline is an almost continuous ocean beach of gravel and sand. For anyone who has a special interest in glaciology or vulcanism, the island is a paradise. There are well over 100 glaciers—the largest exceeds the size of any in Europe and would blanket both Rhode Island and Delaware. Wherever you are in Iceland you can generally depend on at least one glacier being in view. Water from the steady melting of the large glaciers flows to the sea in torrents, gouging awesome canyons and spilling over escarpments in gigantic waterfalls. A better name for Iceland would have been Fireland for, while many countries have glaciers, probably no country has a greater array of volcanic features such as volcanoes, hot springs, mud pots, and sulphur vents. The most recent eruption of a volcano was in 1947-48.

Despite its considerable size, much of Iceland is practically devoid of life. The interior is just desert, being a moraine of rock and sand. Elsewhere, from coast to interior, the terrain is, on the one hand, sharply mountainous with glaciers and extensively barren uplands and, on the other covered for miles by lava beds and ash deposits. Vegetation, land birds and other animals, and the people are necessarily restricted to a comparatively small part of the island's total area—to the lower slopes along fiords, to the few fertile val-

*For an interesting article on this subject, see "Birding in Iceland," by Ralph E. Case, *Audubon Magazine*, January-February 1954 issue. — The Editor

leys, and to the plains that lie between the southwestern coast and the mountains. The towns and principal settlements are widely scattered around the island and are often separated by mountain ranges, but they are nonetheless accessible from Reykjavik by road and/or by air.

Our trips to most parts of the country were taken in a panel truck over graded, unpaved roads. While both vehicle and road surface left much to be desired by way of comfort, the important thing was that they got us where we wanted to go. No camping was necessary, as good hotels and meals were obtainable at conveniently spaced points. What we saw of Iceland frequently astonished us. While I expected the country to have lovely scenery, I was not prepared for such spectacular, all-in-one views of lofty mountains, shining glaciers, lush green lowlands, black lava beds, and blue sky and sea. At seemingly every turn in the road there was a scene, better than the one before, that I wanted to film. The truth is, there were times when I forgot to look for birds, so absorbed was I in trying to record some particular stretch of unrivaled splendor.

Birds of the "dooryard" and "countryside" varieties are notably sparse in Iceland. Most towns and farms, in fact, seem just about birdless on first inspection. There are no house (English) sparrows; starlings have arrived recently but they are still uncommon. The only species you are likely to observe near dwellings are the redwing and white wagtail, both of European origin. From the roads you may count on seeing three other passerines—the meadow pipit (by far the commonest songbird in Iceland), the wheatear, and the snow bunting; and four shorebirds—the Eurasian golden plover (the commonest shorebird), the whimbrel, the redshank, and the common snipe.

Most Icelandic birds are very locally distributed. For example, gyrfalcons occupy only a few cliffs and harlequin ducks only a few streams, although there appear to be many suitable habitat for them. But this needn't discourage you. The distribution of birds in Iceland is well known, thanks to investigations by Dr. Finnur Gudmundsson and several amateur ornithologists. Upon making inquiry you can determine

precisely where certain species occur and how to reach them.

As I suggested in the beginning, stop off in Iceland on your flight to Europe, if it is in late May, June, or early July. Icelandic Airlines (Loftleidir) makes regular refueling stops in Reykjavik between New York and Europe. (Pan American World Airways, with more luxurious accommodations, also stops in Iceland, but at Keflavik, separated from Reykjavik by some 30 miles of horribly rough, dusty road.) Base yourself in Reykjavik at the Hotel Borg, which is first class. You can get fine meals here at two near-by restaurants; the Naust and the Gildaskalinn (less expensive). Without delay visit the Tourist Bureau (about two blocks from the hotel) for maps of the city and country, for information about travel by hired car, bus, and internal air service, and for hotel accommodations elsewhere in the island.

On your first day explore the environs of Reykjavik. Look over the small lake (Tjornin) in the middle of the city, just a short walk from the hotel. Here there is an assortment of both wild and pinioned waterfowl representing nearly all Icelandic species and (believe it or not!) a small nesting colony of arctic terns on a little island. West of the lake is a cemetery (kirkjugardur) where there are low trees in which redwings nest. Search the grassy areas in the vicinity of the airport for redshanks, common snipes, meadow pipits, and white wagtails. Engage a car to take you out to South Point (Sudurnes) and pick you up later. In this area you may find transient knots (until mid-June), nesting oystercatchers, and semipalmated plovers, and perhaps an occasional common eider, black-headed gull, and great black-backed gull.

On your second day, engage a car to take you north of Reykjavik to Middle Mountain Lake (Medalfellsvatn), about 30 miles distant. This is a pretty trip over Iceland's north-bound artery, which skirts the base of Mount Esja on the right (watch for fulmars sailing about the highest cliffs where they nest) and overlooks the sea on the left. Along the way you will be practically certain to identify all the countryside birds I have mentioned above, and the parasitic jaeger. Soon after you turn off the main highway to the lake, the

road you are on crosses a broad meadow, which is one of the few habitats for black-tailed godwits. You should see several pairs. Later the road crosses a stream (the lake's outlet) where you should be able to find harlequin ducks (the males leave for the sea soon after mid-June, if not before). Eventually the road comes to the lake, a breeding area for a pair of whooper swans. If time permits, after you return to the main highway, drive farther northward around Whale Fiord (Hvalfjordur), the southernmost of Iceland's more impressive fiords. At its head you may be interested in watching operations at the whaling station.

During the next four days, visit Fly Lake (Myvatn) in northern Iceland. This is not only the country's place of places for birds, but has by all odds the most amazing concentration of breeding birds that I've seen anywhere. There are grassy and shrubby places bordering the lake where you can flush ducks from their nests every 6 to 10 feet. The species are (in order of decreasing abundance) the greater scaup, tufted duck, oldsquaw, European widgeon, mallard, and common teal. The pintail, common scoter, and red-breasted merganser are much less common. Horned grebes and northern phalaropes are in evidence everywhere around the lake. One of the principal ornithological attractions is the large number of breeding Barrow's goldeneyes.

Fly Lake lies in an extraordinary volcanic district. Craters and weird lava formations poke up from the lake and the adjoining area; within a few miles is colorful Namaskard, with the best of Iceland's mud pots and sulphur vents, and several hot springs in which you can bathe. The lake gets its name from the black-flies (a species of *Simulium*) that breed in the water and, when the weather is warm and windless, rise over the area in clouds. They rarely bite, will not enter your car or tent, but tickle you unmercifully, interfere with your vision, get into your nose, eyes, and ears. Your only protection is to wear a head net of fine mesh. No chemical yet concocted will keep them away from you. (Happily, Fly Lake is the only place in Iceland where there are obnoxious insects. There are no mosquitoes or other biting insects anywhere.)

Continued on page 94

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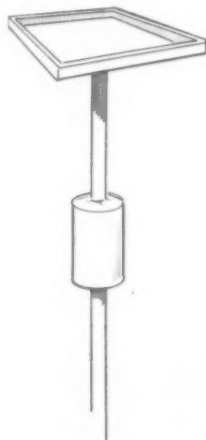
A SQUIRREL-PROOF BIRD FEEDER

By William Ferguson
Omaha, Nebraska

A simple can, with an X cut in top and bottom, solved my chipmunk problem on my bird feeder at Estes Park, Colorado. The can may be painted right along with the iron post and it is not unsightly at all.

However, for our foxy fox squirrel back in Nebraska, it takes a larger diameter can, one of these longish ones such as we buy pineapple juice in.

Both ends of the can should be left intact, except for the X cut so that the iron support pipe can be forced through it. The chipmunks can't get past the smaller can, and the larger squirrels can't get past the longer ones. And by the way, in the case of the larger squirrels, I suppose most folks know that they can jump pretty high, so the can must be placed quite high or the squirrel would simply leap up and land above it, then climb the post to the feeder. —THE END



A "RAID-PROOF" BLUEBIRD HOUSE

By R. W. Corrigan
Smethport, Pennsylvania

People who like to have bluebirds in the yard may be distressed each spring by starlings which sometimes persecute the smaller songsters at nesting time. Even though the starling is unable to enter through an inch-and-a-half entrance-hole in the bluebird box, it will maintain itself in some way at the opening and get its head through to tear up and pull out the nest, time after time.

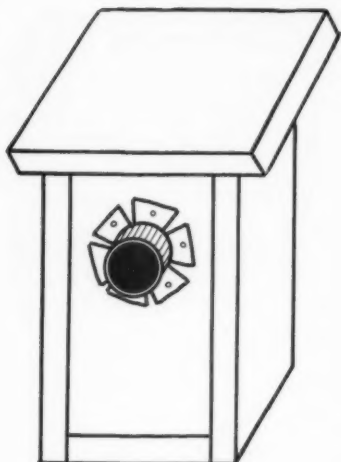
To make this impossible, anybody can

provide a "vestibule" outside the entrance to the birdhouse. An inch or so of extra depth at the entrance will make no difference to the bluebirds, but it will offer obstacle enough to the starlings to keep their beaks out of the bluebird nest. My method is merely to split and spread the mouth of a paper milk container, tacking it evenly around the opening to the birds' box. Being heavily waxed, with a metal ring, this will last for several seasons; or it may be replaced as often as desired.

Dimensions of a very simple box,

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which can be built of plywood of any thickness, or lumber from one inch down, are about as follows:

TOP 9" from front to back by $5\frac{1}{2}$ " wide.

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BOTTOM slide $7\frac{3}{4}$ " front to back by $5\frac{1}{2}$ " wide with drawer handle, to ride on brackets of angle irons (aluminum by choice).

A bit of roofing material over the top will help to insulate the box, and a few drill holes under the roof will aid ventilation.

No back is needed if the box is to be fastened to a wall, as mine is, but if it is to go at the top of a pole, the back may be of any convenient size, with allowance of a few inches at bottom to permit nailing. Another method is to nail the removable bottom on top of the pole, and leave that out for the winter, while storing the empty box. Removing the bottom, however, seems preferable, for this provides for easy cleaning.

—THE END

SELF-SERVICE FOR A CALIFORNIA JAY

By Tamara Andreeva

Mr. and Mrs. M. D. Van Horne of Los Angeles have an unusual winged friend—a wild California scrub jay which visits them every morning at the breakfast table (they even put out a special plate of sunflower seeds for it), and it comes to perch on their knees or shoulders whenever they are enjoying their garden.

For the convenience of the bold jay they have fixed a little cafeteria on their

back porch—jars filled with its favorite goodies—walnuts, sunflower seeds and such, with lids not tight on the jars. It did not take the bird long to discover that it could get at the seeds and nuts by merely knocking the lids off the jars with its strong beak. From then on it would make several flights a day to feast and to take the surplus to bury in the garden and on neighboring lawns. The entire neighborhood in fact is now abloom with sunflowers.



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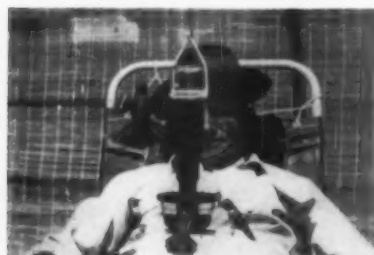
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A WILDLIFE SANCTUARY FOR YOUR COMMUNITY

Continued from page 81

range plans. Unless an area is closely supervised or protected, one can expect it to be subjected to vandalism and become a dumping grounds for trash. The disrespect, and an almost traditional lack of appreciation and consideration for public property by some people, must be reckoned with. One of the first problems is to create the sympathy and interest of unsympathetic and apathetic people. Working with nature, and with birds, by contrast, is relatively easy.

One must consider buildings or other structures on the property, if present, and their upkeep. One also must think of trails or paths and their maintenance. On a big area this can be a sizable chore. A long list of questions and problems must be deliberated. A few follow.

1. Can or will the area be fenced?
2. Does the existing plantlife need immediate control or management?
3. Should plantings be made of various trees and shrubs and of grain and seed plants?
4. Should or can a pond or a series of them be constructed?
5. Are there streams or springs present that must be managed?
6. How extensively will wildlife be furnished with their requirements artificially? Will it need a number of feeders, birdbaths, nesting and roosting boxes, or even nesting materials?
7. Is the area large enough to manage different sections for different types of birds? Can part of it be left in permanent woods? Brushy areas and thickets of trees and shrubs are highly important. Can they be encouraged? Can some of the open field areas be mowed occasionally or left partially clear for field and field border species of wildlife?
8. What can be done to the land to provide swampy or marshy spots?
9. Certain cultivated plants belong. What about those for hummingbirds?

EDUCATIONAL AND INTERPRETIVE PROGRAMS

If the sanctuary is large enough to support a building, shelter, or other structure, quarters can be provided for a whole or a part-time custodian, a meeting place, possibly a museum, and a library. This can be a center or a meeting place for lectures, bird study classes, programs, field trips, and conducted tours. These can be limited to members only or to school groups, adults, and the general public. An active program can add to the esthetic, cultural, and recreational activities of the community.

Individual members and committees of the sponsoring group can conduct informal programs and lectures in the schools and before biology classes, youth groups, and civic club meetings. Small nature trails can be established and labeled. Checklists of birds and other informational material about the sanctuary can be compiled to distribute to members, to visitors, and to be mailed to interested people. Perhaps some members can conduct a series of articles or regular columns on wildlife in the local newspapers. Specialists on bird study and conservation can be invited to give lectures and to lead field trips, programs, and discussions.

A combination of these sanctuary activities can have profound effect on a community and the lives of various individuals in it.

CONCLUSION

The person or committee in charge of the sanctuary program should endeavor to anticipate every problem, need, and opportunity. Various wildlife and conservation specialists of state and federal agencies, colleges, and museums should be consulted before and during the establishment of the sanctuary. Such personnel can give practical suggestions and help you to avoid unexpected pitfalls. A wildlife sanctuary will require continuous planning and supervision. Without continuity it will disintegrate. The sponsoring group should never become discouraged. All problems should be taken as a matter of course and dealt with accordingly.

Every community should, and can, have a wildlife sanctuary. The persons or groups with the willingness to undertake the responsibility should accept it as a challenge.

—THE END

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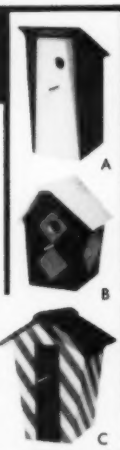
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A CASE FOR NATURAL AREAS

Continued from page 61

full upon it, and a light wind was blowing that made the grasses seem to run, as a flock of sheep would run. Clumps of multiflora roses, and patches of other plants, most of them escaped from nearby gardens or abandoned fields, also grew there. But somehow it is the daisies that I remember most vividly, the immigrant from the Old World that had found its place here.

And here there was no time. The sun beat down, and the wind blew, and some nights it would be lashed by rain. I could see the buildings of the town as I sat in the sun-filled meadow, but I was as distant from them as though I were in the heart of a great wilderness. The myriad things that pressed on me a few minutes ago were gone, and with them care and anxiety. I could think, as if my mind were freed from shackles. Here was timelessness, and an absolute peace.

Through the year, as the seasons changed, the meadow, wood, and ponds remained a home and haven for wild things, following an ageless pattern. The grasses went to seed, and mourning doves flew down to feed. The roses and viburnums matured fruit for fall and winter nourishment. Goldenrods and asters followed the daisies, and the trees flamed out in brilliant autumn colors. As the leaves fell, they piled on the forest floor, to decay and return nutrients to the soil. Autumn rains filled up the ponds that had become but puddles at summer's end, and during cold days there was ice over them, while underneath the water organisms slept their long winter sleep. Snow fell, and when it melted, it was readily absorbed by the soil.

It was around the water that there was the first sign of green and growing things at winter's end. The skunk cabbage bloomed first, and then you knew that soon the red-winged blackbirds would be coming back, their calls ringing from the dried reeds by the field pond. Then it was the chickweed in the meadow, and before you knew it the whole area was pulsing with new life. The frogs and salamanders had laid their eggs in the pools, the birds were coming back, and the leaves were coming out. And it remained a place of timelessness and peace.

Continued on page 88



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A CASE FOR NATURAL AREAS

Continued from page 87

But the human community was growing. They needed a new school, and they decided to build it along the road, next to the meadow. For a long time they planned to build, but they had trouble getting the money, and on the empty site the dewberry ripened its sweet fruit and the grasses grew tall.

Then one year I went away, and it was two months before I took the train home again. I will never forget the moment that I looked out from the window to see the meadow, wood, and ponds and found that they were gone. All that was left was earth up-turned and raw, a bit of the field pond with its reedy bank, and the old cherry tree. Gone was the woodland pool, with its frogs, its turtles, its waterstriders, and all the life that it held therein. Gone was the water-thrush, the multitude of birds. Gone were the trees, the grass, the meadow where the daisies bloomed.

I can still close my eyes now, standing before the razed ground, and see the daisies and roses in the grass. Looking at the barren earth on which the sun beats down without mercy, from which water runs off like mud, I can still feel the coolness of the tree-lined pool and follow the path of the water-thrush. With the plants, the animal life was destroyed also. The mourning doves and a few other birds have turned to the reservoir for their source of water, but many others simply went the way of the daisies. Even the remnant of the field pond was not to last long; on another trip I saw that even it had been drained away, and that the yellow flags would no longer bloom. Only the old black cherry tree remained, lonely guardian of a lost cause, spared because it stood so close to the railroad tracks.

And the irony of it was that the school building itself was not built there. It was built farther out toward the road. Where the meadow had been, and the wood and the ponds, they just put in a "fill," marked it off with cement, and planted lawn grass.

But what is important here is not what I lost. Valuable as those destroyed lives might have been, they are not the most important—the great tragedy is what the school children lost.

If that little area of nature had been spared, the school would have had a living museum outside its doors. How valuable that wood and meadow and those ponds would then have been! There, classes could have gone to learn about animals and to learn about plants. There they would have witnessed how rain filters down through the plants to the receptive soil, how water forms in the depressions. Before their eyes the children would have had the living story of the world of nature. The young people of the community could have become acquainted with ecology, the all-permeating science of the relationships of organisms with their environment and with each other, which is almost never attempted to be taught in the elementary classroom, although its principles become increasingly important parts of our lives. What had seemed dry and uninspiring in books and classrooms would take form and meaning when observed in the field.

If classes had gone there, not only would the teacher have found greater ease and effectiveness in teaching natural history, but children would have learned their lesson painlessly. They would have come to recognize plants and animals that would enrich the rest of their lives; and these future leaders of the community and of the nation would have acquired an understanding of this world without time, this world with which we share dominion of the earth.

Can the child grow up to be a mature and well-balanced adult if his contact with other living things is limited to the grasses on the lawn? Is it not better if he has learned to observe the activities of the wild things, their interrelationships, and the balance they have achieved among each other? What will give him the greatest respect for life in this time when we can annihilate nations?

This may seem irrelevant, but it is the very point that I want to raise. What is the value of learning the classification of organisms unless you can appreciate their place in the total functioning of the whole organism which is our world? How are you going to appreciate the miracle that is life if you are only exposed to the lives of your own kind, and never come in contact with other

living things? And if in childhood you learned to disregard those other lives that you never came to know, how are you going to conduct yourself later, when you have to make decisions that affect the rest of society? How are you going to deal with the problems of ever-decreasing natural resources if you have never become familiar with their functioning?

For us to sustain our level of living, we must reach some approximation of an equilibrium between our consumption and what we and the earth together can produce. For us to even approach this, we must have some understanding of ecology—the interrelationships within the world we live in, and our own relationships within that world. Ecology, from its ancient root, is the “study of the house”—the study of the whole; and while the bits and pieces that can be learned from books make only an incomplete picture, ecology can be grasped by a child exposed to a living natural community—our natural area.

True that our meadow, wood, and ponds were not “natural” in the sense that they were wild, primeval. But in a greater sense they were “natural,” for they were the products of the natural ecological evolution of an area under the influence of one of its component organisms—man.

The school children could have learned there how land reacts to man's influence—what brought the meadow, and what flowers came in; what are the first trees to colonize the edges of the railroad tracks; how man's use of water might have affected the water table, and how this change in turn affected plants and animals; what animals can tolerate close proximity to his cities; how the heat of industrial activity might have affected the climate of that area. Man is a part of this world of nature. He cannot stand apart from it; he affects his environment, and his environment affects him. If he comes to understand this process, and to realize the consequences that some of his actions may have, he may clash with nature less often.

The natural area will help him to understand, for these natural areas are to be used. People are not to be kept out—but in them they are to acquire a respect for life. These areas can be used again and again, and

will never be depleted. Perhaps that is the miracle of it—that they are, above all, capable of intensive use. The use that is made of them does not kill. Indeed, it promotes life, for it cultivates a reverence for life.

Natural areas are of many forms, from the wilderness of the distant ranges to a meadow where daisies bloom. They may be set aside to keep the land from being changed, or they may preserve change. But their value to us—the people—is the same. Looking at the barren ground beside the railroad tracks, remembering again that afternoon in June when I found my natural area where the water-thrush walked, I hope that others may think of the little pond, or a woodland that might be saved, and then do something to keep the area safe—for all of us.

— THE END.

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By Amy Clampitt, Librarian, Audubon House

PERSPECTIVES ON CONSERVATION: ESSAYS ON AMERICA'S NATURAL RESOURCES

By John Kenneth Galbraith, Ernest S. Griffith, Luther Gulick, Edward S. Mason, Thomas B. Nolan, Gilbert F. White, and others. The Johns Hopkins Press, Baltimore, 1958. 9¼ x 6 in., 260 pp. Indexed. \$5.00.

In the early months of 1958, Resources for the Future sponsored a series of public lectures and discussions, held in Washington, D. C., on various aspects of conservation. The six major addresses were each followed by somewhat briefer prepared comment, and the whole is here made available in permanent form. The most striking fact about the entire discussion is what amounts to a veritable Grand Canyon of divergence, as deep as it is broad, between Malthusian gloom, on the one hand, regarding the rapid rate of increase in the world's population, and the buoyant optimism, on the other, of those who pin their faith to the technological ingenuity of the human species. The most hopeful of these latter is Thomas B. Nolan, the Director of the U. S. Geological Survey, who entitles his paper, "The Inexhaustible Resource of Technology." Perhaps the most balanced assessment of this issue comes from Edward S. Mason, the Dean of the Graduate School of Public Administration at Harvard, who remarks that "while science and technology are wonderful, they show no signs as yet of exorcising the persistent fact of scarcity." Dean Mason's very learned and penetrating address on "The Political Economy of Resource Use" is nevertheless, when it comes to a discussion of the petroleum industry, perhaps the most controversial in the entire series—which may suggest how far from being cut-and-dried any of it is. Another provocative contribution is J. K. Galbraith's forthright and lively phrasing of a question which, in his opinion, conservationists tend to evade—namely, is our standard of living too high? This is not, of course,

a new question. Thoreau was already asking it, in still more radical terms, a century ago; and more recently it was the theme of an excellent small book by Samuel H. Ordway. But it is now an issue which is going to be pondered and debated with increased concern by responsible people—all of whom can hardly fail to find these essays of great significance and to whom they are warmly recommended.

THE ECOLOGY OF INVASIONS BY ANIMALS AND PLANTS

By Charles S. Elton, Wiley, New York, 1958. 8¾ x 5½ in., 181 pp. Illustrated. Indexed. \$5.25.

A new book by Dr. Elton, widely recognized as the dean of animal ecologists, is bound to be an event. Certainly this one is: a concise work, but a major one, it may be regarded as a sequel to his classic "Animal Ecology." How much complex information he is able to pack into a single paragraph which is still a pleasure to read, his admirers already know. He discusses here, with characteristic wit and vast learning, various animal invasions of continents, of remote islands, and of the oceans and other large bodies of water, going on to suggest modifications of some previous hypotheses concerning population balance and food-chains. Two final chapters are on conservation—"a protean word," as he remarks, "for it can mean on the one hand the preservation of wild species against the advance of human exploitation; alternatively, the methods of attaining the highest productivity from exploited lands." He observes that the ecological communities most easily thrown out of balance are the simpler (because artificial) ones created by man; and it is his recommendation that "if wilderness is in retreat, we ought to learn how to introduce some of its stability and richness into the landscapes from which we grow our natural resources." It is of particular interest to note his concern with the effects of the well-known recent use of

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toxic chemicals, in connection with which he recounts the following tale of one which was used as a fungicide spray by some entomologists in Nova Scotia: "A change in chemical composition of one of these sprays used against apple scab was followed by enormous multiplication of scale insects on the apple bark and twigs. It was found that the old spray killed the scale insect, one of its enemies, and one of its parasites. But the new one left the scale insect unharmed, while still destroying its enemy and parasite, thus proving again the value of the old Chinese proverb that 'there is no economy in going to bed early to save candles if the result be twins.'"

COLLECTING, PRESERVING AND STUDYING INSECTS

By *Harold Oldroyd*, Macmillan, New York, 1958. 57½ x 9¼ in., 327 pp. Illustrated. Indexed. \$5.00.

A more admirably thorough, good-humored, and authoritative manual for insect collectors, of whatever age or status, could hardly be desired. Detailed instructions are given on all aspects of the pursuit, from how to handle a net to when, where, and whether to publish one's entomological findings; nor are such matters neglected as the proper method of getting rid of old cyanide bottles, the vexed question of pronouncing scientific names, classification, identification, and photography. This is a British book, but its references to hedgerows and other things specifically British should deter nobody. Mr. Oldroyd writes so entertainingly as to divert even a non-collector, as in his description of the "Great Entomologist" who "strolls about in a superior way, and occasionally brings out a tube or a pill-box to pick up a single insect. If there are visitors present he tells them its name, and usually says it is a great rarity, so that they imagine him rushing off to his study as soon as they are gone to write a paper about it. What he usually does in fact is to forget it until his wife empties his pockets."

WILD PARADISE: THE STORY OF THE COTO DONANA EXPEDITIONS

By *Guy Mountfort*, Houghton Mifflin, Boston, 1958. 6¾ x 9¾ in., 240 pp. Illustrated. Indexed. \$7.00.

Until a very few years ago, the huge wilderness of the Coto Doñana, in southwestern Spain, had scarcely been heard of here, except perhaps by a few wistful ornithologists. For centuries it was a private hunting preserve; today, still in private hands, it is what Mr. Mountfort calls "probably the most important and most richly populated sanctuary in Europe." This genial and entertaining book is an account of three

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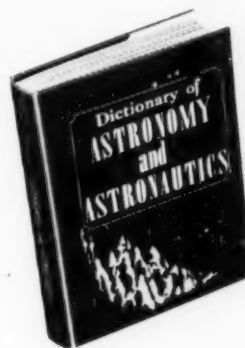
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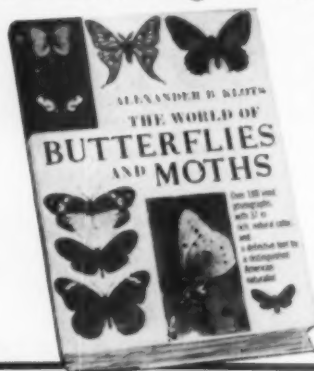
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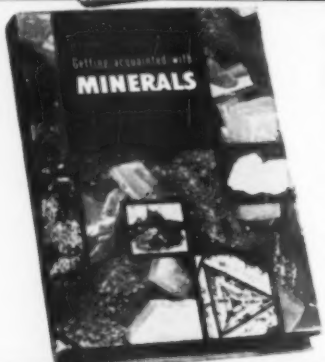
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expeditions to the region, in which a distinguished roster of naturalists and wildlife photographers — among them Roger Peterson and Field Marshal Alanbrooke—took part. They compiled a list of the birds, made intensive studies of their nesting habits and of the ecology of the region, weathered such hazards and discomforts as ticks, leeches, wild bulls, high winds, and torrid temperatures, and in general—despite these last—found much to delight the eye, the ear, and the growing civilized thirst for the remote and primitive. Anyone who shares this thirst should likewise delight in Mr. Mountfort's book, and in the accompaniment of Eric Hosking's photographs.

GRAND CANYON: TODAY AND ALL ITS YESTERDAYS

By Joseph Wood Krutch, William Sloane Associates, New York, 1958. 8 3/8 x 5 5/8 in., 276 pp. Illustrated. \$5.00.

"You can't tell me it was made without human aid." To appreciate the full absurdity of this remark, which continues to be made at the brink of the most stupendous of our natural wonders, one must have some notion of what did in fact make it. Here, with the unique blend of enthusiasm and civilized irony which have won him a deserved and devoted following, Mr. Krutch gives an admirably clear idea of the pre-human forces which produced it, and of its all but overwhelming effect upon a receptive human consciousness. He gives, besides, a bit of its history since men—first red, then white,—came into the picture, and devotes a chapter to the ecology of the Canyon region, including an excellent brief summary of the tragedy of the Kaibab deer—an episode which, famous though it is in certain circles, ought to be more famous still.

A PARENT'S GUIDE TO CHILDREN'S READING

By Nancy Larrick, Doubleday, New York, 1958. 5 3/8 x 8 1/2 in., 283 pp. Illustrated. Indexed. \$2.95 (also in a paperback edition from Pocket Books at 35¢).

From among the welter of children's books it becomes, these days, harder and harder to choose those which (a) are worth reading and (b) children really like. As its main feature this most commendable book offers an annotated list of juvenile titles which have appeared in the last 20 years or so, which have stayed in print, and which in the opinion of young readers as well as their elders are worthy of mention. The author gives, in addition, some lively and sensible advice on reading aloud, on how children learn to read, on choosing and using reference books, and (reassuringly) on those ubiquitous but

not altogether villainous influences, TV and the comics. This is a non-profit venture undertaken by the National Book Committee with the cooperation of 18 national organizations representing children, parents, librarians, teachers, and others concerned—as we all should be—with what children are reading.

THE AMERICAN OASIS

By Edward Higbee, Alfred A. Knopf, New York, 1957. 8½ x 5¼ in., 262 pp. Illustrated. Indexed. \$5.00.

According to the definition of the United States Census, Mr. Higbee tells us, a farmer may be anything from "a Nevada rancher with half a million acres of sagebrush and a few thousand Hereford cows," to "a three-acre Philadelphia suburbanite with a summertime impulse to raise raspberries for the gang at the office." The special needs, problems, and techniques which make it so difficult for a lettuce-grower in the Salinas Valley and a Wisconsin dairyman to understand each other, or for a city-dweller born and raised to understand either one, are here set forth in a book which beautifully combines the freshness of first-hand experience and the dispassionate lucidity of a scholar. The author is a former government agronomist who is now on the faculty of the Graduate School of Geography at Clark University, and he spent some months in traveling and talking to farmers in all parts of the country as a preparation for writing the book. Many of the men whose farms he visited are quoted, and the histories of a number of farms are given in some detail. Some of what he records is disturbing, some of it exhilarating; now and then it is also deeply moving. But all of it is absorbing reading, which for anyone who cares about the future of our resources, should also be required reading.

JUNIOR BOOKS

SNOW TRACKS (4-7)

By Jean George, Dutton, New York, 1958. 8¾ x 7 in., 62 pp. Illustrated. \$2.50.

Once again the author of "The Hole in the Tree" has looked out upon the ecological world and found it funny. The chief actors in this tale of deep winter are Chief Half-an-Ear, who at two-and-a-half is the oldest mouse of his tribe, and the Feared Animal, a trapper, who is evidently not yet five. That spoofing sort of irony which only a truly respectful adult can maintain for long in the presence of the young, is here maintained until just before the end, where it breaks down, as such spoofing ought to, into open hilarity. The author's illustrations seem almost haphazard until one looks again, and

realizes how much skill, as well as warmth, their spontaneity contains.

SEE THROUGH THE LAKE (7-10)

By Millicent Selsam, Harper, New York, 1958. 8¾ x 6½ in., 48 pp. Illustrated. \$2.50.

Anyone in search of simple material on food chains will welcome this addition to an attractive series. Here, as in earlier volumes, the style and grace of the Winifred Lubell's illustrations do more than embellish a brisk and straightforward text: they add a dimension of poetry which, in the welter of informational books that flood the market these days, is too often lacking.

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All lavishly illustrated in color

HOUGHTON MIFFLIN COMPANY, 2 Park Street, Boston 7, Massachusetts

Your CHILDREN

By Shirley Miller

LAST May in this column we introduced you to Betty Davis, age 13, and to Sam Davis, Jr., her brother, age 11. You met them again in December when a protest from them about the spraying of insecticides was published in this magazine's "Letters" column. These two ardent young conservationists, living on a farm near Hayesville, N. C., had been introduced to us by John K. Terres, editor of this periodical, who carries on an active correspondence with this sister-brother team, and communications from them are becoming red-letter events.



Betty Davis (upper) and Sam Davis, Jr.

They send word about the pileated woodpecker they feed from a stump in their backyard; about the awards they received at their 4-H Club County Recognition Day; of the wildlife booth they arranged at their County Fair and the \$15 prize this brought them; how the meetings of the Audubon Junior Club they organized have become so popular that "one little girl ran the two miles from her home in order to be on time." These letters also contain such gems as "We were up before daylight and cleaned the snow from our

feeders. We heated one of mother's iron skillets, placed food in it and set it on the post feeder. The birds seemed to enjoy warming their feet while they ate." Also, "Somehow a cake of soap got in the bowl with Charley, the turtle, and he has been blowing bubbles all evening."

This correspondence started about two years ago when, in childish handwriting, it told mainly of the birds they were beginning to recognize on their farm, and of the delight that these discoveries were bringing them. Now matters have progressed to neatly typed letters that express, in well-worded phraseology, not only the fun they have with the wildlife on their farm, but growing concern for their well-being. A letter of January 8 reads, "As we write this, there are about a dozen titmice and chickadees in the Bird's Christmas Tree just outside the window. A downy wood-

pecker is walking up an oak tree and Hoppy, the one-legged English sparrow is back in the post feeder. We first noticed him on December 1. At first, when he left the feeder, he would hop over to the edge and tumble off. Now he can fly off without the tumble. We wonder how he lost his leg. We also wonder why we don't have as many birds this year. Last year we had 16 species coming to our feeders regularly during December. This year we have only counted eight species and not nearly so many of each kind. Friends in Atlanta and Charlotte write us that they don't have as many, either. We wonder if many of them have been poisoned by insecticides. We hope the day will come when everyone will realize the value of birds and try to protect them. We are teaching the members of our Audubon Junior Club how important they are." — THE END

BIRD FINDING WITH PETTINGILL

Continued from page 83

You can go all the way to Fly Lake from Reykjavik by bus, but I recommend that you save time by flying directly to Akureyri via Iceland Airways (Flugfölag Islands) and there take a bus to Hotel Reynihlid at the lake. The trip from Akureyri over mountains and through deep valleys is one of the most scenic in Iceland. The hotel is modern and has excellent food (Icelandic style). About a mile south of the hotel is a birch woods where you can find the wren (same as our winter wren) and perhaps a few common redpolls. Soon after arriving at the hotel get in touch with Sverrir Tryggvasson, the hotel's farmer, who is interested in birds and speaks English well. Have him give you instructions for reaching: (1) Sluttnes. The best spot for ducks. (2) Hofdi. A private estate on the lake where you can readily view Barrow's goldeneyes. The birds nest in the perforated lava formations that jut up from the lake. (3) The nearest eyries of gyrfalcons. There are at least two within walking distance.

So far I have not mentioned Iceland's enormous colonies of sea birds—common puffins (by far the most abundant), razorbills, common murre, black-legged kittiwakes, and fulmars. If they appeal to you particularly, then you should go to the Westmann Islands (Vestmannaeyjar), situated off the south coast. The Westmanns are odd formations of volcanic origin, rising abruptly from the sea to dizzy heights. Their

sheer sides and grassy tops are literally alive with birds. The largest island, Heimaey, has a snug harbor and a picturesque town of 5,000 people whose principal occupation is fishing. Two other islands, Hellisey and Ellidaey, have large populations of birds I have already named. In addition, Hellisey has a small colony of gannets and Ellidaey has nests of Manx shearwaters, Leach's petrels, and storm petrels.

You can easily reach Heimaey by Iceland Airways in 25 minutes and can obtain good accommodations and meals at the Hotel HB. Two gentlemen, the Reverend Johann Hlidar and Pall Steingrimsen, speak English fluently and will be very helpful to you in arranging for a boat and crew to take you to the islands. A few words of caution: allow plenty of time for the trip. Once you are on Heimaey you may be delayed in getting away, as the planes cannot land or take off when the wind is blowing at right angles to the airstrip, which runs in an east-west direction only. You must have a calm sea in order to get on either Hellisey or Ellidaey. This may take days of waiting. And once you are on either island you must be prepared for some scrambling, with the aid of the boat's crew and a rope, before reaching level ground two or three hundred feet up.

In planning to travel in Iceland, you need not worry about the language barrier. Though Icelandic is impossible to understand (even by Norwegians and other Scandinavian

Continued on page 96

Audubon Market Place

CLASSIFIED ADVERTISING

Rates for classified advertising: 15¢ a word; minimum order \$3.00

Binoculars—Telescopes—Microscopes

BE FIRST TO NAME THE BIRD! with binoculars especially adapted by us for bird-watching! Send for details. Also, Bausch & Lomb, Leitz, and 2 grades of Japanese with quality comparison. Every glass—even the Mirakel Specials from \$29.50—checked by instrument in our famous Repair Shop, and covered by our **FREE-SERVICE GUARANTEE**. Liberal trade-ins. 30 day trial—we pay postage. Free consultation—write us or visit us. Open Saturdays 10-1. See following ad. **THE REICHERTS, Mirakel Optical Co.**, Mount Vernon 2, New York, Mount Vernon 4-2772.

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NATURE IN THE NEWS

Continued from page 77

lasting impressions which will lead those who sat on one end of a log while they sat and taught from the other to long think about, study, and enjoy nature.

The camp is a "must" for teachers, leaders of youth groups, persons concerned with conservation, and those who

BIRD FINDING WITH PETTINGILL

Continued from page 94

peoples, if that's any consolation!), you can most always find someone with whom to converse. In Reykjavik, persons at the desks in the airport, airlines offices, Hotel Borg, and Tourist Bureau speak English; and Dr. Gudmundsson has a fine command of the language. In places outside the city you may run into difficulty, but you can use your ingenuity (e.g., "sign language") and a pocket dictionary (you should acquire one, if you expect to be on your own).

Always in your favor, when you go bird finding in Iceland, is the daylight, which is continuous around the clock. Even while the sun is below the horizon briefly, beginning about midnight, there is still enough light for seeing birds. So you can do a lot of bird finding in a day — just

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are seriously interested in wildlife or nature as a hobby.

Its program is ideal for parents who plan to take their children camping during their growing years. Their vacations in the outdoors would be immeasurably more worth while and profitable if parents could pass on to their children what they had learned at Audubon camp.

about as much as you can stand with-out sleep.

For a little instructive reading prior to your trip, I suggest: "The Land of the Loon," by G. K. Yeates (1951, Country Life Limited, London); "Birding in Iceland," by Ralph E. Case (*Audubon Magazine*, January-February 1954, pp. 32-33, 38-39). Be sure to take "A Field Guide to the Birds of Britain and Europe," by Roger Tory Peterson, Guy Mountfort, and P. A. D. Hollom (1954, Houghton Mifflin Company, Boston). It is indispensable, because it includes Iceland. If you wish to meet Dr. Gudmundsson, when you arrive in Reykjavik, you will find him at the Museum of Natural History (address: P.O. Box 532). Undoubtedly, he will be willing to advise you, as he did us, on the best spots for birds and how to reach them. **THE END.**

BIOLOGY TEACHER WANTED for September. Pleasant suburban New York secondary school. Start to \$7000. Maximum to \$9500. Free Registration. Write NOW. **City-Suburban Teachers Agency, 550 Fifth Avenue, New York 36, N. Y.**

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Our readers should know that beside The Audubon Camp of California, the National Audubon Society operates The Audubon Camp of Wisconsin, The Audubon Camp of Connecticut, and The Audubon Camp of Maine. The same stimulating program is given at each camp, but interesting variations are provided by the different animals and different plants of the camp areas, which are in different parts of the country. Additional information about each camp can be found on other pages of this issue.—The Editor

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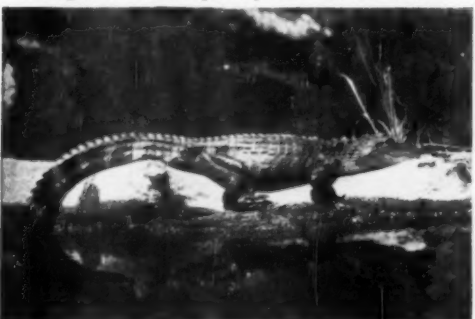
Cruising through a canal on the Everglades National Park Tour.



Tourists on the boardwalk at the Corkscrew Swamp Sanctuary.

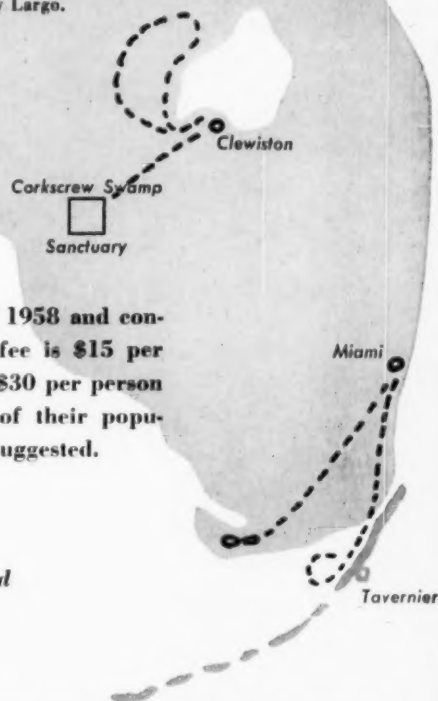


Alligators are frequently seen on the tours.



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The tours start in December, 1958 and continue into April, 1959. The fee is \$15 per person for one-day trips and \$30 per person for two-day trips. Because of their popularity, early reservations are suggested.

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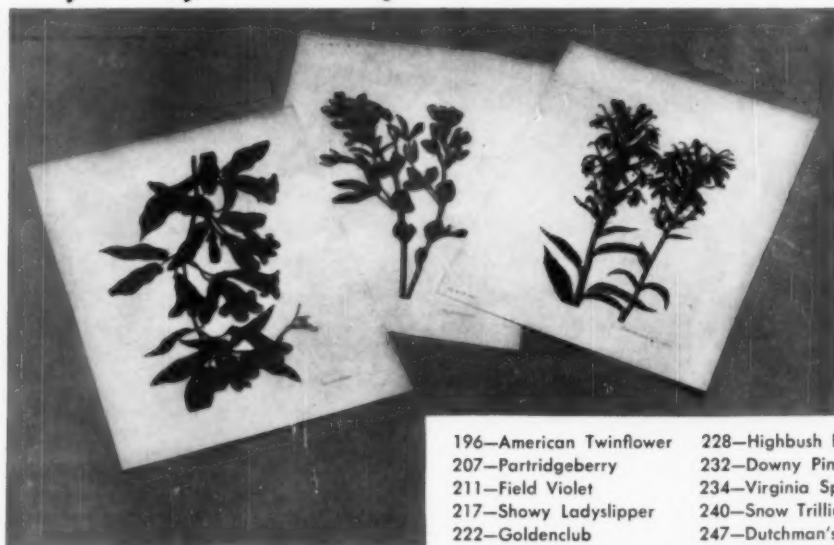
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